This document provides pertinent information concerning the reissuance of the VPDES Permit listed below. This permit is being processed as a Minor, Municipal permit. The discharge results from the operation of a 0.037 MGD wastewater treatment plant. This permit action consists of updating the proposed effluent limits to reflect the current Virginia Water Quality Standards (effective 6 January 2011) and updating permit language as appropriate. The effluent limitations and special conditions contained within this permit will maintain the Water Quality Standards of 9VAC25-260 et seq.

1.	Facility Name and Mailing Address:	DOC – Caroline Correctional Unit #2 31285 Camp Road Hanover, VA 23069	SIC Code:	4952 WWTP
	Facility Location:	31285 Camp Road, Route 677 Hanover, VA 23069	County:	Caroline
	Facility Contact Name:	Dallas L. Phillips Environmental Services Manager	Telephone Number:	757-514-3592
		Lydell LeSane Treatment Plant Operator	Telephone Number:	804-994-2161
	Facility Email Address:	Dallas.Phillips@vadoc.virginia.gov Lydell.Lesane@vadoc.virginia.gov		
2.	Permit No.:	VA0023329	Expiration Date:	2 August 2015
	Other VPDES Permits:	Not Applicable		
	Other Permits:	Registration No. 40570 – air permit for emergency generator. ID Number 3039767 – above ground petroleum storage tanks. PWSID 6033150 – public water supply		
	E2/E3/E4 Status:	Not Applicable		
3.	Owner Name:	Virginia Department of Corrections		
	Owner Contact / Title:	Dallas L. Phillips Environmental Services Manager	Telephone Number:	757-514-3592
		Timothy G. Newton Environmental Services Director	Telephone Number:	804-887-8069
	Owner Email Address:	Dallas.Phillips@vadoc.virginia.gov Timothy.Newton@vadoc.virginia.gov		
4.	Application Complete Date:	20 January 2015		
	Permit Drafted By:	Douglas Frasier	Date Drafted:	24 August 2015
	Draft Permit Reviewed By:	Anna Westernik	Date Reviewed:	7 September 2015
	Draft Permit Reviewed By:	Alison Thompson	Date Reviewed:	19-20 October 2015
	Public Comment Period:	Start Date: 13 November 2015	End Date:	14 December 2015
5.	Receiving Waters Information:	See **Attachment 1** for the Flow Frequency Determination.		
	Receiving Stream Name:	Herring Creek, UT	Stream Code:	8-XDF
	Drainage Area at Outfall:	0.02 square miles*	River Mile:	0.28
	Stream Basin:	York River	Subbasin:	None
	Section:	3	Stream Class:	III
	Special Standards:	None	Waterbody ID:	VAN-F21R

*Updated based on planning statement (**Attachment 5**)

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Receiving Waters Information (continued):

7Q10 Low Flow:	0.0 MGD	7Q10 High Flow:	0.0 MGD
1Q10 Low Flow:	0.0 MGD	1Q10 High Flow:	0.0 MGD
30Q10 Low Flow:	0.0 MGD	30Q10 High Flow:	0.0 MGD
Harmonic Mean Flow:	0.0 MGD	30Q5 Flow:	0.0 MGD

6. **Statutory or Regulatory Basis for Special Conditions and Effluent Limitations:**

X	State Water Control Law	X	EPA Guidelines
X	Clean Water Act	X	Water Quality Standards
X	VPDES Permit Regulation		Other:
X	EPA NPDES Regulation		

7. **Licensed Operator Requirements:** Class III

8. **Reliability Class:** Class II

9. **Facility / Permit Characterization:**

	Private	X	Effluent Limited		Possible Interstate Effect
	Federal	X	Water Quality Limited		Compliance Schedule
X	State		Whole Effluent Toxicity Program		Interim Limits in Permit
	POTW		Pretreatment Program		Interim Limits in Other Document
X	eDMR Participant		Total Maximum Daily Load (TMDL)		

10. **Wastewater Sources and Treatment Description:**

The Caroline Correctional Unit #2 WWTP receives domestic wastewater from incarcerated adult inmates housed at the correctional facility and corrections staff. The treatment process consists of screening, flow equalization, extended aeration via an oxidation ditch, secondary sedimentation, chlorine disinfection, dechlorination and post aeration prior to discharge.

Influent passes through screening consisting of one mechanical and one manual, bypass bar screen. The screened wastewater then flows through flow equalization prior to a dual channel oxidation ditch, which is operated in the extended aeration mode. Effluent from the oxidation ditch is routed to a final clarifier; then pumped to a DynaSand up-flow filter for additional solids removal. Filtered effluent flows via gravity to the chlorine contact chamber. Chlorine addition is via tablet feeders in a distribution bay followed by dechlorination. Post aeration consists of step aeration prior to discharge.

Plans are proceeding to replace the oxidation ditch with a sequencing batch reactor (SBR). Per the reissuance application, construction is anticipated to begin in early 2016 and finish approximately one year later.

See **Attachment 2** for a facility schematic/diagram.

TABLE 1
OUTFALL DESCRIPTION

Number	Discharge Sources	Treatment	Design Flow	Latitude / Longitude
001	Domestic Wastewater	See Section 10	0.037 MGD	37° 50′ 07″ / 77° 19′ 42″

See **Attachment 3** for the Hanover topographic map.

11. Sludge Treatment and Disposal Methods:

Dewatered sludge from this facility is transported to the Powhatan Correctional Center WWTP in State Farm, Virginia for eventual land application; which is regulated under that facility's VPDES permit (VA0020699).

12. Other Permitted Discharges Located Within Waterbody VAN-F21R:

TABLE 2
PERMITTED DISCHARGES

Permit Number	Facility Name	Type	Receiving Stream
VAG110206	Beasley Concrete Inc.	Concrete Products General Permit	Mattaponi River, UT
VAR052276	Chenault Lumber Inc.	Stormwater Industrial General Permit	
VAG840146	Luck Stone Corp. – Caroline Plant Milford	Non Metallic Mineral Mining General Permit	
VA0092649	Mr. Fuel 4	Stormwater Industrial Individual Permit	Reedy Creek, UT

13. Material Storage:

TABLE 3
MATERIAL STORAGE

Materials Description	Volume Stored	Spill/Stormwater Prevention Measures
Polymer (emergency use)	10 gallons, maximum	Under roof, in a locked storage room.
Chlorine tablets	Five 45 pound pales	
De-chlorination tablets	Six 45 pound pales	
Household bleach (for potable water)	60 gallon containers, maximum	

14. Site Inspection:

Performed by DEQ-NRO Compliance staff on 19 July 2011 (see **Attachment 4**).

15. Receiving Stream Water Quality and Water Quality Standards:

a. Ambient Water Quality Data

This facility discharges into an unnamed tributary to Herring Creek, which has not been monitored or assessed. However, a freshwater probabilistic monitoring station 8-HER012.99, located on Herring Creek, was last sampled in 2002. It is located 1.7 miles downstream of the confluence or approximately 2 miles downstream of Outfall 001; downstream of the Route 601 bridge. The following is the water quality summary for this segment of Herring Creek as taken from the 2012 Integrated Report:

- Class VII, Section 3;
- DEQ monitoring station located in this segment of Herring Creek: Freshwater probabilistic monitoring station 8-HER012.99, downstream of Route 601;
- Biological monitoring indicates that the aquatic life use is not supporting;

- The wildlife use is considered fully supporting; and
- The fish consumption and recreation uses were not assessed.

The nearest downstream DEQ ambient water quality monitoring station is located at the Route 609 bridge. Station 8-HER005.12 is located approximately 11 miles downstream of Outfall 001. The following is the water quality summary for this segment of Herring Creek as taken from the 2012 Integrated Report:

- Class VII, Section 3;
- DEQ monitoring station located in this segment of Herring Creek: Ambient monitoring station 8-HER005.12, at Route 609;
- The recreation, aquatic life and wildlife uses are considered fully supporting; and
- The fish consumption use is categorized as impaired due to a Virginia Department of Health, Division of Health Hazards Control, mercury fish consumption advisory. Additionally, five exceedances of the fish tissue value (TV) of 300 parts per billion (ppb) for mercury (Hg) in fish tissue was recorded in five species of fish samples collected in 2003 at monitoring station 8-HER005.12 (bluegill sunfish, chain pickerel, flier sunfish, largemouth bass and yellow bullhead catfish).

b. 303(d) Listed Stream Segments and Total Maximum Daily Loads (TMDLs)

TABLE 4
DOWNSTREAM 303(d) IMPAIRMENTS AND TMDLs

Waterbody Name	Impaired Use	Cause	TMDL Completion/Schedule	WLA	Basis for WLA
Impairment Information in the 2012 Integrated Report					
Herring Creek	Aquatic Life	Benthic Macroinvertebrates	2020	--	--
	Fish Consumption	Mercury	2018	--	--
Mattaponi River	Fish Consumption	PCBs	2022	--	--

This facility discharges to an unnamed tributary to Herring Creek within the Chesapeake Bay watershed. The receiving stream has been identified in the Chesapeake Bay TMDL; approved by the Environmental Protection Agency (EPA) on 29 December 2010. The TMDL addresses dissolved oxygen (D.O.), chlorophyll a and submerged aquatic vegetation (SAV) impairments in the main stem Chesapeake Bay and its tributaries by establishing nonpoint source load allocations (LAs) and point source wasteload allocations (WLAs) for total nitrogen (TN), total phosphorus (TP) and total suspended solids (TSS) to meet applicable Virginia Water Quality Standards contained in 9VAC25-260-185.

Implementation of the Chesapeake Bay TDML is currently accomplished in accordance with the Commonwealth of Virginia's Phase I Watershed Implementation Plan (WIP); approved by EPA on 29 December 2010. The approved WIP recognizes the *General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed of Virginia* (9VAC25-820 et seq.) as controlling the nutrient allocations for nonsignificant Chesapeake Bay dischargers. The approved WIP states that for nonsignificant municipal facilities, nutrient WLAs are to be consistent with Code of Virginia procedures, which set baseline WLAs at 2005 permitted design capacity nutrient load levels.

The TN and TP wasteload allocations for nonsignificant facilities are considered aggregate allocations; however, adherence with current agency guidance, this facility will be required to monitor TN and TP effluent concentration levels during this permit term. Data collected from all nonsignificant facilities will be utilized to verify the estimated facility nutrient loads and the subsequent aggregate wasteload allocations found in the aforementioned WIP.

The WIP also considers TSS WLAs for nonsignificant facilities to be aggregate allocations; yet, TSS limits are to be included in individual VPDES permits in conformance with the technology-based requirements found in the Clean Water Act. Furthermore, the WIP recognizes that as long as the aggregated TSS permitted loads for all dischargers is less than the aggregated TSS load in the WIP, the individual permit will be consistent with the TMDL. This individual permit includes TSS limits of 20 mg/L; therefore, this facility is in conformance with technology-based requirements and, in turn, consistent with the Chesapeake Bay TMDL.

Moreover, this individual permit includes limits for ammonia, biochemical oxygen demand-5 day and dissolved oxygen, which provide protection of instream D.O. concentrations of at least 5.0 mg/L. As such, the proposed effluent limits for these parameters are consistent with the Chesapeake Bay TMDL and will not cause an impairment or observed violation of the standards for D.O., chlorophyll a or SAV as required by 9VAC25-260-185.

The planning statement is found in **Attachment 5**.

c. Receiving Stream Water Quality Criteria

Part IX of 9VAC25-260(360-550) designates classes and special standards applicable to defined Virginia river basins and sections. The receiving stream, an unnamed tributary to Herring Creek, is located within Section 3 of the York River Basin and classified as Class III water.

At all times, Class III waters must achieve a dissolved oxygen (D.O.) of 4.0 mg/L or greater, a daily average D.O. of 5.0 mg/L or greater, a temperature that does not exceed 32° C and maintain a pH of 6.0 – 9.0 standard units (S.U.).

The Freshwater Water Quality / Wasteload Allocation Analysis located in **Attachment 6** details other water quality criteria applicable to the receiving stream. Please note that some Water Quality Criteria are dependent on the pH, temperature and total hardness of the receiving stream and/or final effluent. These values were utilized during the criterion determination that follows:

pH and Temperature for Ammonia Criteria

The fresh water, aquatic life Water Quality Criteria for ammonia is dependent on the instream pH and temperature. Since the effluent may have an impact on the instream values, the pH and temperature values of the effluent must also be considered when determining the ammonia criteria for the receiving stream. The 90th percentile pH and temperature values are utilized because they best represent the critical conditions of the receiving stream.

The critical 30Q10 and 1Q10 flows of the receiving stream have been determined to be 0.0 MGD. In cases such as this, effluent pH and temperature data may be utilized to establish the ammonia water quality criteria. See **Attachment 7** for the derived 90th percentile values of all reported effluent pH data for the September 2010 to December 2014 time period.

Since effluent temperature data was not readily available, staff utilized a default temperature value of 25° C and an assumed temperature value of 15° C for summer and winter, respectively.

The calculated ammonia water quality criteria may be found in **Attachment 6**.

Hardness Dependent Metals Criteria

The Water Quality Criteria for some metals are dependent on the receiving stream and/or effluent total hardness values (expressed as mg/L calcium carbonate).

Since there is no hardness data for this facility or the receiving stream, staff guidance suggests utilizing a default hardness value of 50 mg/L $CaCO_3$ for streams east of the Blue Ridge.

The hardness dependent metals criteria in **Attachment 6** are based on this default value.

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Bacteria Criteria

The Virginia Water Quality Standards at 9VAC25-260-170.A. state that the following criteria shall apply to protect primary recreational uses in surface waters:

E. coli bacteria per 100 mL of water shall not exceed the following:

	Geometric Mean[1]
Freshwater *E. coli* (N/100 mL)	126

[1]For a minimum of four weekly samples taken during any calendar month

d. Receiving Stream Special Standards

The State Water Control Board's Water Quality Standards, River Basin Section Tables (9VAC25-260-360, 370 and 380) designates the river basins, sections, classes and special standards for surface waters of the Commonwealth of Virginia. The receiving stream, unnamed tributary to Herring Creek, is located within Section 3 of the York River Basin. This section has not been designated with a special standard.

16. Antidegradation (9VAC25-260-30):

All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

It is staff's best professional judgement that the receiving stream be classified as Tier 1 based on the following: (1) the stream critical flows have been determined to be zero; (2) at times the stream flow may be comprised of only effluent; and (3) the downstream impairments noted in Section 15.b. of this Fact Sheet.

The proposed permit limits have been established by determining wasteload allocations which will result in attaining and/or maintaining all water quality criteria which apply to the receiving stream, including narrative criteria. These wasteload allocations will provide for the protection and maintenance of all existing uses.

17. Effluent Screening, Wasteload Allocation and Effluent Limitation Development:

To determine water quality-based effluent limitations for a discharge, the suitability of data must first be determined. Data is suitable for analysis if one or more representative data points are equal to or above the quantification level ("QL") and the data represent the exact pollutant being evaluated.

Next, the appropriate Water Quality Standards (WQS) are determined for the pollutants in the effluent. Then, the Wasteload Allocations (WLAs) are calculated. In this case since the critical 7Q10, 1Q10 and 30Q10 flows have been determined to be zero, the WLAs are equal to the WQS. The WLA values are then compared with available effluent data to determine the need for effluent limitations. Effluent limitations are needed if the 97th percentile of the daily effluent concentration values is greater than the acute wasteload allocation or if the 97th percentile of the four-day average effluent concentration values is greater than the chronic wasteload allocation. In the case of ammonia evaluations, limits are needed if the 97th percentile of the thirty-day average effluent concentration value is greater than the chronic WLA. Effluent limitations are based on the most limiting WLA, the required sampling frequency and statistical characteristics of the effluent data.

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a. Effluent Screening

Effluent data obtained from the permit application and the September 2010 to December 2014 Discharge Monitoring Reports (DMRs) have been reviewed and determined to be suitable for evaluation. Please refer to **Attachment 8** for a summary of effluent data.

The following pollutants require a wasteload allocation analysis since this is a treatment plant treating domestic sewage and the method of disinfection employed at this facility: ammonia as nitrogen and chlorine.

b. Mixing Zones and Wasteload Allocations (WLAs)

Wasteload allocations (WLAs) are calculated for those parameters in the effluent with the reasonable potential to cause an exceedance of water quality criteria. The basic calculation for establishing a WLA is the steady state complete mix equation:

$$WLA = \frac{C_o [Q_e + (f) (Q_s)] - [(C_s) (f) (Q_s)]}{Q_e}$$

Where:
- WLA = Wasteload allocation
- C_o = In-stream water quality criteria
- Q_e = Design flow
- Q_s = Critical receiving stream flow (1Q10 for acute aquatic life criteria; 7Q10 for chronic aquatic life criteria; harmonic mean for carcinogen-human health criteria; 30Q10 for ammonia criteria; and 30Q5 for non-carcinogen human health criteria)
- f = Decimal fraction of critical flow
- C_s = Mean background concentration of parameter in the receiving stream.

The water segment receiving the discharge via Outfall 001 has been determined to have critical 7Q10, 1Q10 and 30Q10 flows of 0.0 MGD. As such, there is no mixing zone and the WLA is equal to the C_o.

c. Effluent Limitations, Outfall 001 – Toxic Pollutants

9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an instream excursion of water quality criteria. Those parameters with WLAs that are near effluent concentrations are evaluated for limits.

The VPDES Permit Regulation at 9VAC25-31-230.D requires that monthly and weekly average limitations be imposed for continuous discharges from POTWs and monthly average and daily maximum limitations be imposed for all other continuous non-POTW discharges.

1) Ammonia as N/TKN

Staff reevaluated the effluent pH data in order to ascertain the ammonia water quality criteria, wasteload allocations (WLAs) and subsequent ammonia limitations (**Attachment 9**). DEQ guidance suggests using a sole data point of 9.0 mg/L to ensure the evaluation adequately addresses the potential presence of ammonia in discharges containing treated domestic sewage.

It was determined that ammonia limitations of 1.8 mg/L were calculated for both the monthly and weekly average. However, antibacksliding provisions do not allow for the relaxation of limits except in specific circumstances. As such, the existing monthly average limitation of 1.3 mg/L will be carried forward with this reissuance. Refer to **Attachment 9** for the calculation.

The Environmental Protection Agency (EPA) finalized new, more stringent ammonia criteria in August 2013; possibly resulting in significant reductions in ammonia effluent limitations. It is staff's best professional judgement that incorporation of these criteria into the Virginia Water Quality Standards is forthcoming. This and many other facilities may be required to comply with these new criteria during their next respective permit terms. As noted above, it is staff's best professional judgement that the previous limitation of 1.3 mg/L be carried forward with this reissuance. The ammonia criteria will be revisited during the next reissuance.

2) Total Residual Chlorine (TRC)

Chlorine is currently utilized for disinfection and is potentially in the discharge. Staff calculated WLAs for TRC using current critical flows. In accordance with current DEQ guidance, staff employed a default data point of 0.2 mg/L and the calculated WLAs to derive limitations. A monthly average of 0.008 mg/L and a weekly average limit of 0.010 mg/L are proposed for this discharge (see **Attachment 10**).

3) Metals/Organics

It is staff's best professional judgement that given the wastewater sources; limitations are not warranted at this time.

d. Effluent Limitations and Monitoring, Outfall 001 – Conventional and Non-Conventional Pollutants

No changes to dissolved oxygen (D.O.), biochemical oxygen demand-5 day (BOD_5), total suspended solids (TSS), ammonia and pH limitations are proposed.

Dissolved oxygen, TSS and BOD_5 limitations are based on the stream modeling conducted in March 1988 (**Attachment 11**) and are set to meet the water quality criteria for D.O. in the receiving stream. This model run was conducted to address the facility's request for an increase in discharge flow to the present tier of 0.037 MGD. Since the facility has not requested an additional flow tier (expansion) and no issues have been noted in the receiving stream, it is staff's best professional judgement that it is not necessary to rerun the Regional Dissolved Oxygen Model during this reissuance.

It is staff's practice to equate the TSS limits with the BOD_5 limits since the two pollutants are closely related in terms of treatment of domestic sewage.

pH limitations are set at the water quality criteria.

E. coli limitations are in accordance with the Water Quality Standards 9VAC25-260-170.

e. Effluent Monitoring, Outfall 001 – Nutrients

As discussed in Section 15.b. of this Fact Sheet, significant portions of the Chesapeake Bay and its tributaries are listed as impaired with nutrient enrichment cited as one of the primary causes. Nonsignificant discharges located within the Chesapeake Bay watershed are subject to aggregate wasteload allocations for total nitrogen (TN), total phosphorus (TP) and sediments under the Total Maximum Daily Load (TMDL) for the Chesapeake Bay. Monitoring for TN and TP during this permit term will be required in order to assess and verify the aggregate wasteload allocations.

f. Effluent Limitations and Monitoring Summary

The effluent limitations are presented in Section 19. Limits were established for biochemical oxygen demand-5 day (BOD_5), total suspended solids (TSS), ammonia as N, pH, dissolved oxygen (D.O.), *E. coli* and total residual chlorine. The facility will also monitor for total Kjeldahl nitrogen, nitrate+nitrite, total nitrogen and total phosphorus as discussed previously in Section 15.b. and 17.e.

The limits for TSS are based on Best Professional Judgment and verified in the aforementioned stream model.

The mass loading (kg/d) for monthly and weekly averages were calculated by multiplying the concentration values (mg/L), with the flow values (in MGD) and then a conversion factor of 3.785.

Sample Type and Frequency are in accordance with the recommendations in the VPDES Permit Manual.

The VPDES Permit Regulation at 9VAC25-31-30 and 40 CFR Part 133 require that the facility achieve at least 85% removal for BOD and TSS (or 65% for equivalent to secondary). The limits in this permit are water quality-based effluent limits and result in greater than 85% removal.

18. Antibacksliding:

All limits in this permit are at least as stringent as those previously established. Backsliding does not apply to this reissuance.

19. Effluent Limitations/Monitoring Requirements:

Design flow is 0.037 MGD.

Effective Dates: During the period beginning with the permit's effective date and lasting until the expiration date.

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Average	Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	NA	NA	NL	1/D	Estimate
pH	3	NA	NA	6.0 S.U.	9.0 S.U.	1/D	Grab
BOD_5	3,5	20 mg/L 2.8 kg/day	30 mg/L 4.2 kg/day	NA	NA	1/M	Grab
Total Suspended Solids (TSS)	2,5,6	20 mg/L 2.8 kg/day	30 mg/L 4.2 kg/day	NA	NA	1/M	Grab
Dissolved Oxygen (D.O.)	3,5	NA	NA	6.5 mg/L	NA	1/D	Grab
Ammonia, as N	3	1.3 mg/L	1.3 mg/L	NA	NA	1/M	Grab
E. coli (Geometric Mean) [a.]	3	126 n/100 mL	NA	NA	NA	1/W	Grab
Total Residual Chlorine (after contact tank)	4	NA	NA	1.0 mg/L	NA	1/D	Grab
Total Residual Chlorine (after dechlorination)	3	0.008 mg/L	0.010 mg/L	NA	NA	1/D	Grab
Total Kjeldahl Nitrogen (TKN)	6,7	NL mg/L	NA	NA	NA	1/YR	Grab
Nitrate+Nitrite, as N	6,7	NL mg/L	NA	NA	NA	1/YR	Grab
Total Nitrogen [b.]	6,7	NL mg/L	NA	NA	NA	1/YR	Calculated
Total Phosphorus	6,7	NL mg/L	NA	NA	NA	1/YR	Grab

The basis for the limitations codes are:

1. Federal Effluent Requirements
2. Best Professional Judgement
3. Water Quality Standards
4. DEQ Disinfection Guidance
5. Stream Model – **Attachment 11**
6. Chesapeake Bay TMDL/WIP
7. Guidance Memo No. 14-2011 – *Nutrient Monitoring for "Nonsignificant" Discharges to the Chesapeake Bay Watershed*

MGD = Million gallons per day.
NA = Not applicable.
NL = No limit; monitor and report.
S.U. = Standard units.

1/D = Once every day.
1/W = Once every week.
1/M = Once every month.
1/YR = Once every calendar year.

Estimate = Reported flow is to be based on the technical evaluation of the sources contributing to the discharge.
Grab = An individual sample collected over a period of time not to exceed 15 minutes.

a. Samples shall be collected between 10:00 a.m. and 4:00 p.m.

b. Total Nitrogen = Sum of TKN plus Nitrate+Nitrite

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20. Other Permit Requirements:

Part I.B. of the permit contains additional chlorine monitoring requirements, quantification levels and compliance reporting instructions

These additional chlorine requirements are necessary per the Sewage Collection and Treatment Regulations at 9VAC25-790 and the Water Quality Standards at 9VAC25-260-170. Minimum chlorine residual must be maintained at the exit of the chlorine contact tank to ensure adequate disinfection. No more that 10% of the monthly test results for TRC at the exit of the chlorine contact tank shall be < 1.0 mg/L with any TRC < 0.6 mg/L considered a system failure. *E. coli* limits are defined in this section as well as monitoring requirements to take effect should an alternate means of disinfection be used.

9VAC25-31-190.L.4.c. requires an arithmetic mean for measurement averaging and 9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an instream excursion of water quality criteria. Specific analytical methodologies for toxics are listed in this permit section as well as quantification levels (QLs) necessary to demonstrate compliance with applicable permit limitations or for use in future evaluations to determine if the pollutant has reasonable potential to cause or contribute to a violation. Required averaging methodologies are also specified.

21. Other Special Conditions:

a. 95% Capacity Reopener. The VPDES Permit Regulation at 9VAC25-31-200.B.4 requires all POTWs and PVOTWs develop and submit a plan of action to DEQ when the monthly average influent flow to their sewage treatment plant reaches 95% or more of the design capacity authorized in the permit for each month of any three consecutive month period. This facility is a POTW.

b. Indirect Dischargers. Required by VPDES Permit Regulation, 9VAC25-31-200.B.1 and B.2 for POTWs and PVOTWs that receive waste from someone other than the owner of the treatment works.

c. O&M Manual Requirement. Required by Code of Virginia §62.1-44.19; Sewage Collection and Treatment Regulations, 9VAC25-790; VPDES Permit Regulation, 9VAC25-31-190.E. The permittee shall maintain a current Operations and Maintenance (O&M) Manual. The permittee shall operate the treatment works in accordance with the O&M Manual and shall make the O&M Manual available to Department personnel for review upon request. Any changes in the practices and procedures followed by the permittee shall be documented in the O&M Manual within 90 days of the effective date of the changes. Non-compliance with the O&M Manual shall be deemed a violation of the permit.

d. CTC, CTO Requirement. The Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulations, 9VAC25-790 requires that all treatment works treating wastewater obtain a Certificate to Construct (CTC) prior to commencing construction and to obtain a Certificate to Operate (CTO) prior to commencing operation of the treatment works.

e. Licensed Operator Requirement. The Code of Virginia at §54.1-2300 et seq. and the VPDES Permit Regulation at 9VAC25-31-200.C., and by the Board for Waterworks and Wastewater Works Operators and Onsite Sewage System Professionals Regulations (18VAC160-20-10 et seq.) requires licensure of operators. This facility requires a Class III operator.

f. Reliability Class. The Sewage Collection and Treatment Regulations at 9VAC25-790 require sewage treatment works to achieve a certain level of reliability in order to protect water quality and public health consequences in the event of component or system failure. Reliability means a measure of the ability of the treatment works to perform its designated function without failure or interruption of service. The facility is required to meet reliability Class II.

g. Water Quality Criteria Reopener. The VPDES Permit Regulation at 9VAC25-31-220.D. requires establishment of effluent limitations to ensure attainment/maintenance of receiving stream water quality criteria. Should effluent monitoring indicate the need for any water quality-based limitations, this permit may be modified or alternatively revoked and reissued to incorporate appropriate limitations.

h. Sludge Reopener. The VPDES Permit Regulation at 9VAC25-31-220.C. requires all permits issued to treatment works treating domestic sewage (including sludge-only facilities) include a reopener clause allowing incorporation of any applicable standard for sewage sludge use or disposal promulgated under Section 405(d) of the CWA. The facility includes a sewage treatment works.

i. Sludge Use and Disposal. The VPDES Permit Regulation at 9VAC25-31-100.P; 220.B.2, and 420 through 720 and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on their sludge use and disposal practices and to meet specified standards for sludge use and disposal. The facility includes a treatment works treating domestic sewage.

j. Nutrient Reopener. 9VAC25-40-70.A. authorizes DEQ to include technology-based annual concentration limits in the permits of facilities that have installed nutrient control equipment, whether by new construction, expansion or upgrade. 9VAC25-31-390.A. authorizes DEQ to modify VPDES permits to promulgate amended water quality standards.

k. Total Maximum Daily Load (TMDL) Reopener. Section 303(d) of the Clean Water Act requires that Total Maximum Daily Loads (TMDLs) be developed for streams listed as impaired. This special condition is to allow the permit to be reopened if necessary to bring it into compliance with any applicable TMDL approved for the receiving stream. The reopener recognizes that, according to Section 402(o)(1) of the Clean Water Act, limits and/or conditions may be either more or less stringent than those contained in this permit. Specifically, they can be relaxed if they are the result of a TMDL, basin plan or other wasteload allocation prepared under section 303 of the Act.

22. Permit Section Part II:

Required by VPDES Regulation 9VAC25-31-190, Part II of the permit contains standard conditions that appear in all VPDES Permits. In general, these standard conditions address the responsibilities of the permittee, reporting requirements, testing procedures and records retention.

23. Changes to the Permit from the Previously Issued Permit:

a. Special Conditions:

- The TMDL reopener was included with this permit reissuance per current Agency standard.
- A Nutrient Reopener was included with this reissuance; coinciding with current Agency guidance concerning nutrient monitoring and reporting during this permit term.

b. Monitoring and Effluent Limitations:

- Nutrient monitoring was included with this permit term per current Agency guidance.

c. Other:

- The drainage area at the outfall was updated with this reissuance based on new information obtained in the planning statement.

24. Variances/Alternate Limits or Conditions: Not Applicable

(Remainder of page intentionally left blank)

25. Public Notice Information:

First Public Notice Date: 12 November 2015 Second Public Notice Date: 19 November 2015

Public Notice Information is required by 9VAC25-31-280 B. All pertinent information is on file and may be inspected and copied by contacting the: DEQ Northern Regional Office; 13901 Crown Court, Woodbridge, VA 22193; Telephone No. 703-583-3873; Douglas.Frasier@deq.virginia.gov. See **Attachment 12** for a copy of the public notice document.

Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address and telephone number of the writer and of all persons represented by the commenter/requester, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. Requests for public hearings shall state 1) the reason why a hearing is requested; 2) a brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit; and 3) specific references, where possible, to terms and conditions of the permit with suggested revisions. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given. The public may request an electronic copy of the draft permit and fact sheet or review the draft permit and application at the DEQ Northern Regional Office by appointment.

26. Additional Comments:

Previous Board Action(s):	None.
Staff Comments:	The permit was not reissued prior to the expiration date due to Department processing delays.
State/Federal Agency Comments:	Virginia Department of Health had no comments or objections regarding this reissuance.
Public Comments:	No comments were received during the public notice.
Owner Comments:	None.

Fact Sheet Attachments

Table of Contents

DOC – Caroline Correctional Unit #2
VA0023329
2015 Reissuance

ATTACHMENT 1

Flow Frequency Determination

MEMORANDUM

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

NORTHERN VIRGINIA REGIONAL OFFICE

13901 Crown Court Woodbridge, VA 22193

SUBJECT: Flow Frequency Determination
DOC - Caroline Correctional Unit 2 STP (VA0023329)

TO: Permit Re-issuance File

FROM: Susan Mackert

DATE: April 9, 2010

This memo supersedes the March 11, 1999, memo from Paul Herman concerning the subject VPDES permit.

Planning staff were asked to determine the drainage area at Outfall 001 for VPDES permit VA0023329, as this information was not included in the fact sheet for the existing permit. Based on a review by planning staff, the drainage area was determined to be 0.7 mi^2.

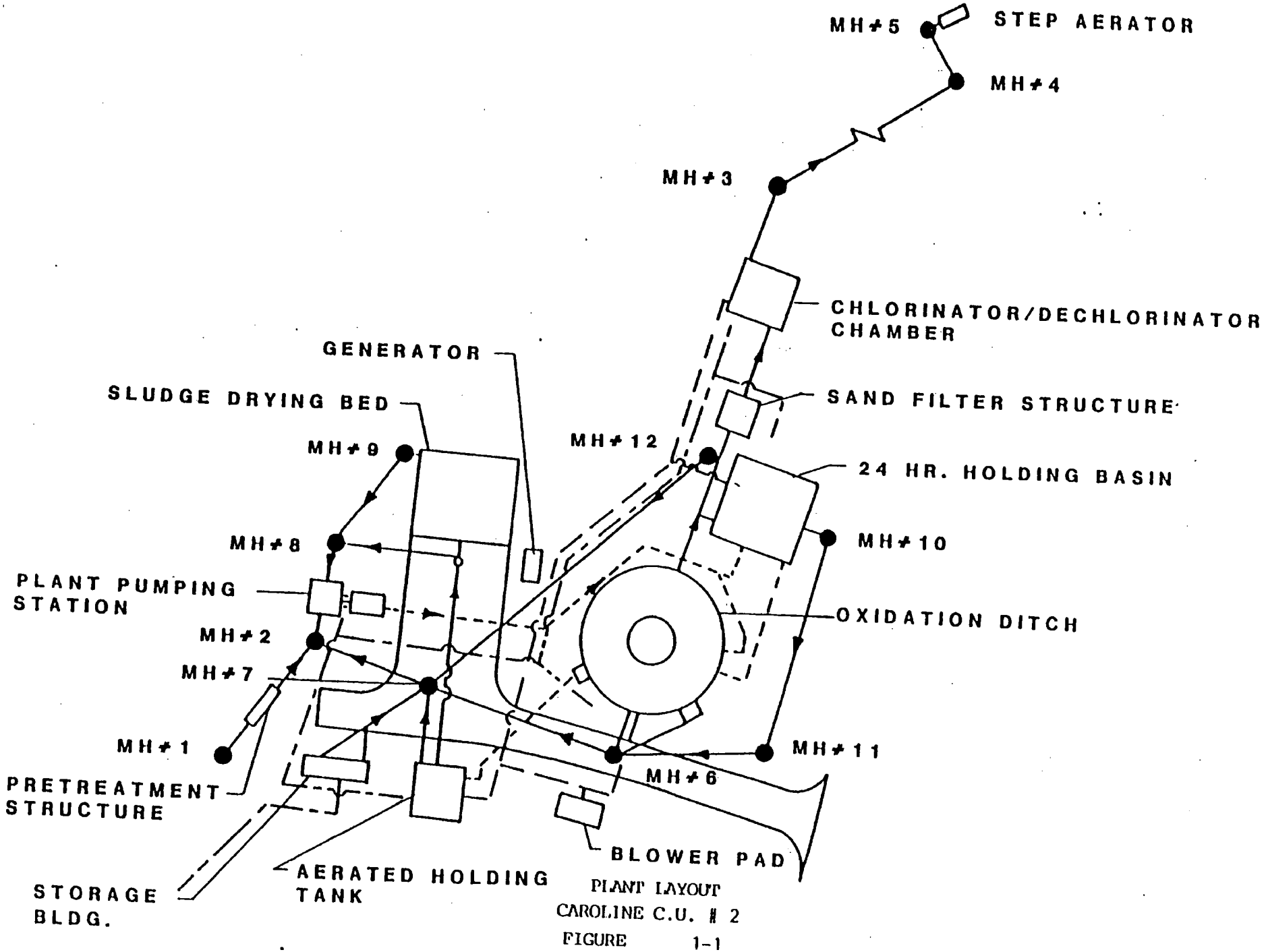
The DOC – Caroline Correction Unit 2 STP discharges to an un-named tributary of Herring Creek. Stream flow frequencies are required at this site for use in developing effluent limitations for the VPDES permit. The previous flow frequency determination was based on a review of the USGS Hanover quadrangle topographical map which showed the receiving stream as a dry ravine which drained to Herring Creek. Additionally, at the confluence Herring Creek is a swamp. The memo states that flow frequencies for dry ditches and swamps are 0.0 cfs. Thus, the following flow frequencies were applied.

1Q10 = 0.0 cfs	High Flow 1Q10 = 0.0 cfs
7Q10 = 0.0 cfs	High Flow 7Q10 = 0.0 cfs
30Q5 = 0.0 cfs	Harmonic Mean = 0.0 cfs

The 2010 drainage area determination and critical flow judgement are consistent with the 1999 flow frequencies utilized in the existing permit. Therefore, critical flows of 0.0 cfs shall be carried forward with this reissuance.

ATTACHMENT 2

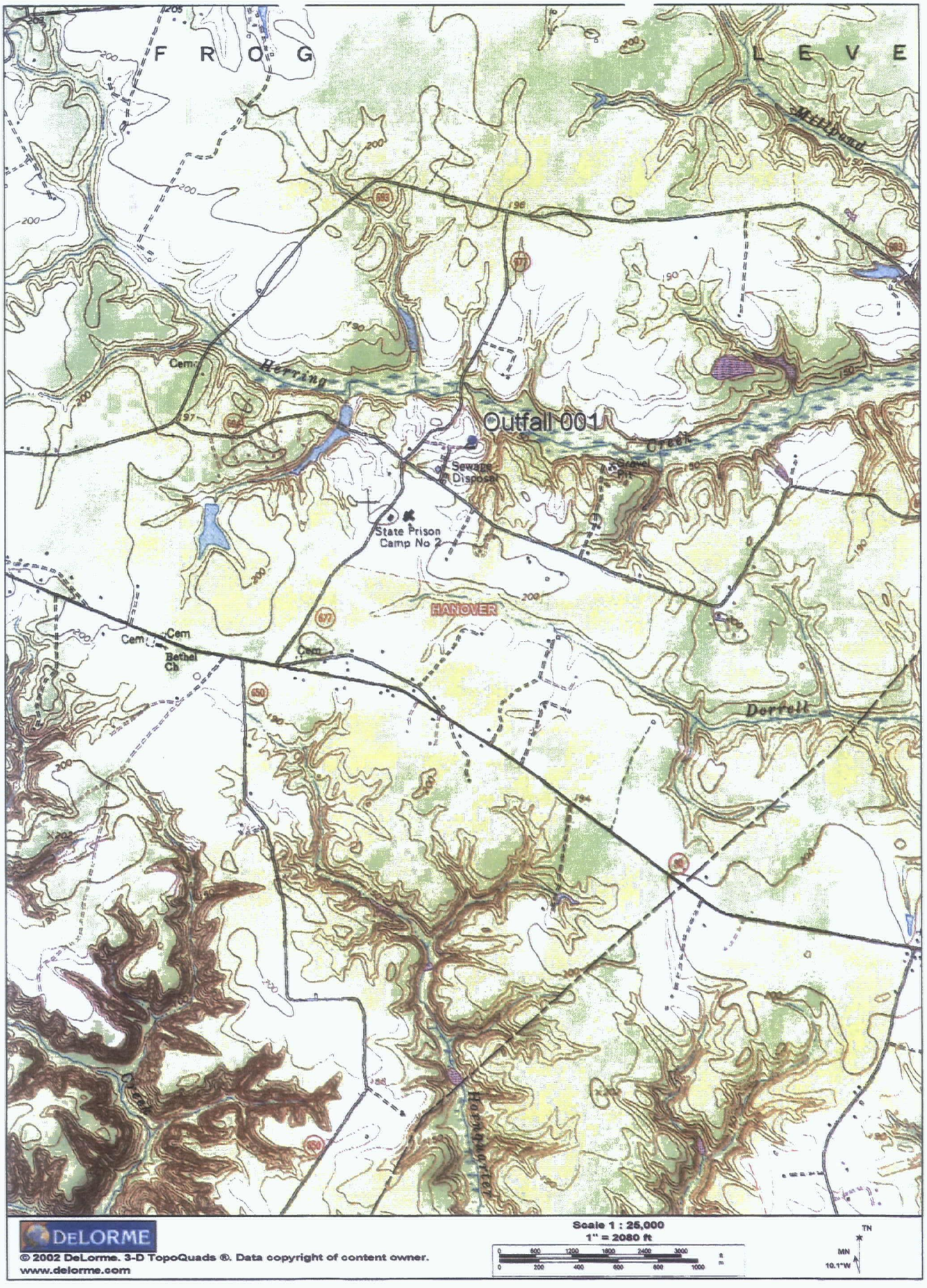
Facility Schematic/Diagram



PLANT LAYOUT
CAROLINE C.U. # 2
FIGURE 1-1

ATTACHMENT 3

Topographic Map


F R O G
L E V E
Outfall 001
Herring
Creek
Sewage Disposal
Gravel Pit
State Prison Camp No 2
HANOVER
Cem
Bethel Ch
Dorrell
Scale 1 : 25,000
1" = 2080 ft
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www.delorme.com
DeLORME

ATTACHMENT 4

Site Inspection Report

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
NORTHERN REGIONAL OFFICE
13901 Crown Court, Woodbridge, Virginia 22193
(703) 583-3800 Fax (703) 583-3821
www.deq.virginia.gov

Doug Domenech
Secretary of Natural Resources

David K. Paylor
Director

Thomas A. Faha
Regional Director

August 16, 2011

Mr. Dallas Phillips
Environmental Services Manager
Virginia Department of Corrections
Eastern Regional Office
1001 Obici Industrial Boulevard, Suite F
Suffolk, VA 23434

Re: Caroline Correctional Unit #2 STP, Permit #VA0023329

Dear Mr. Phillips:

Attached is a copy of the Inspection Report generated from the Facility Technical Inspection conducted at Caroline Correctional Unit #2 – Sewage Treatment Plant (STP) on July 19, 2011. This letter is not intended as a case decision under the Virginia Administrative Process Act, Va. Code § 2.2-4000 *et seq.* (APA).

Please review the enclosed report and submit in writing adequate documentation of all measures taken (including all necessary supporting documentation) to address the Request for Corrective Action no later than September 16, 2011.

Your response may be sent either via the US Postal Service or electronically, via E-mail. If you choose to send your response electronically, we recommend sending it as an Acrobat PDF or in a Word-compatible, write-protected format. Additional inspections may be conducted to confirm that the facility is in compliance with permit requirements.

If you have any questions or comments concerning this report, please feel free to contact me at the Northern Regional Office at (703) 583-3882 or by e-mail at Sharon.Allen@deq.virginia.gov.

Sincerely,

Sharon Allen

Sharon Allen
Environmental Specialist II

cc: Permits / DMR File

Electronic copy sent:
Compliance Manager, Compliance Auditor – DEQ

DEQ
WASTEWATER FACILITY INSPECTION REPORT
PREFACE

VPDES/State Certification No.	(RE) Issuance Date	Amendment Date	Expiration Date
VA0023329	**August 3, 2010**		**August 2, 2015**

Facility Name	Address	Telephone Number
Caroline Correctional Unit #2	**31285 Camp Road Hanover, VA 22911**	**804-994-2784**
Owner Name	Address	Telephone Number
Virginia Department of Corrections	**4150 Hayes Mill Road Baskerville, VA 23915**	**(757) 925-2212**
Responsible Official	Title	Telephone Number
Dallas Phillips	**Environmental Services Manager**	**(757) 925-2212**
Responsible Operator	Operator Cert. Class/number	Telephone Number
Paul Hardesty	**1911004844**	**804-994-2161**

TYPE OF FACILITY:

DOMESTIC				**INDUSTRIAL**			
Federal		Major		Major		Primary	
Non-federal	**X**	Minor	**X**	Minor		Secondary	

INFLUENT CHARACTERISTICS:	DESIGN:
Flow	**0.037 MGD**
Population Served	**187**
Connections Served	**1 prison**

EFFLUENT LIMITS: mg/L unless otherwise specified

Parameter	Min.	Avg.	Max.	Parameter	Min.	Avg.	Max.
pH	**6.0**		**9.0**	**DO**	**6.5**		
BOD_5		**20**	**30**	**TSS**		**20**	**30**
Ammonia-N		**1.3**	**1.3**	**TRC, Contact tank**	**1.0**		
TRC, final eff.		**.008**	**0.010**	**E. coli n/100ml (geometric mean)**		**126**	

Receiving Stream	**UT, Herring Creek**
Basin	**York**
Discharge Point (LONG)	**37° 50′ N**
Discharge Point (LAT)	**77° 19′ W**

Problems identified at last inspection: **Nov 28, 2006**	Corrected	Not Corrected
1. A final effluent Total Residual Chlorine (TRC) reading taken at 1004 by Beth Biller resulted in a value of 1.51 mg/L. At the time only one tube of dechlorination tablets were in use. A second tube was added and a TRC reading taken at 1027 resulting in a 0.00 mg/L value. **DEQ recommends evaluating TRC sample collection time and analysis and adjusting dechlorination as necessary to prevent permit violations.**	[X]	[ ]

SUMMARY July 2011

Comments:

- **The plant records are thorough and overall maintenance of the facility appears to be good.**
- **The O&M manual for this facility was received at NRO November 1991. Review of the O&M manual as part of this inspection revealed the following:**
  - **The limits included in the O&M manual (page 2-2) are no longer correct.**
  - **Operational/process control analyses discussed in the O&M manual are not being done at this time.**
  - **The O&M manual does not discuss the bar screen or influent pump station.**
  - **The sand filter has been off-line for several years. The O&M manual should be updated to incorporate this change.**
  - **Effluent flow is not measured at the V-notch weir but is estimated from the potable water meter.**
  - **The laboratory equipment list page 6-1 is outdated.**
  - **The sample location for final samples is at outfall, not in the post aeration tank.**
- **Mr. Phillips informed me on July 25 that the DOC is shutting down the Haynesville Correctional Center (Unit 17) WWTP, which has the same type of wastewater treatment system. Parts will be brought to Caroline Unit 2 for use as spare parts.**
- **The staff has TVed the sewer line leading into the STP and discovered that it is in disrepair and a source of I&I and high influent flows at the STP. High flows have been the cause at least one solids washout and one overflow of the sludge drying beds.**
- **There were petroleum stains on concrete slab holding back up generator - possibly form overfilling. Mr. Hardesty didn't think was from leaks of the generator itself. As part of good housekeeping practices and to prevent possible contamination of stormwater runoff, fuel and oil spills must be cleaned up promptly and cleanup materials disposed of properly.**

REQUEST for CORRECTIVE ACTION:

- **This permit requires one grab sample for BOD5, TSS, and Ammonia-N per month. These samples are often collected on the first day of the month. While DEQ appreciates the effort made to collect the samples early to assure that they are run on time and plenty of time for re-sample as necessary, please note that samples must be collected during the first FULL week of the month (Sunday – Saturday) in order to be considered valid for calculating weekly maximum loading and concentrations.**

- **The O&M manual must be reviewed and updated as required by permit VA0023329, Part I, Page. Section H, Number 3. This section states, in part, "This manual shall include, but not necessarily be limited to, the following items, as appropriate:**
  - **Techniques to be employed in the collection, preservation, and analysis of effluent and sludge samples;**
  - **Procedures for measuring and recording the duration and volume of treated wastewater discharged;**
  - **Discussion of Best Management Practices, if applicable;**
  - **Procedures for handling, storing, and disposing of all wastes, fluids, and pollutants that will prevent these materials from reaching state waters.**
  - **Treatment works design, treatment works operation, routine preventative maintenance of units within the treatment system, critical spare parts inventory and record keeping**
  - **A plan for the management and/or disposal of waste solids and residues.**

- **A spare parts inventory must be established and documented for this facility.**

- **The Air lift RAS line and the WAS valve should be repaired so clarifier solids can be easily directed as Return Activated Sludge (RAS) or Waste Activated Sludge (WAS) by the plant operators. Repairs should be completed as soon as possible. Proper operation and Maintenance of the facility is required by Part II, Page 6, Section Q.**

- **Repair the influent line leading into the WWTP to reduce the amount of I&I entering the WWTP. As part of the response to this inspection report please include the following information:**
  - **Plan and schedule for addressing the influent line structural integrity;**
  - **Method(s) and schedule for evaluating the sanitary sewer collection system serving this facility.**

VPDES NO. **VA0023329**

DEQ
WASTEWATER FACILITY
INSPECTION REPORT
PART 1

Inspection date: **July 19, 2011**

Date form completed: **August 10, 2011**

Inspection by: **S. Allen**

Inspection agency: **DEQ - NRO**

Time spent (hours w/ travel & report): **22 Hrs**

Announced: **No**

Reviewed by: 8/10/11

Scheduled: **Yes**

Present at inspection: **Paul Hardesty- operator**

TYPE OF FACILITY:

Domestic

[ ] Federal
[X] Nonfederal

[ ] Major
[X] Minor

Industrial

[ ] Major
[ ] Minor

[ ] Primary
[ ] Secondary

Type of inspection:

[X] Routine
[ ] Compliance/Assistance/Complaint
[ ] Reinspection

Date of last inspection: **Nov 28, 2006**
Agency: **DEQ**

Population served: approx. **187**

Connections served: **1**

Last month average: **June 2011**

Flow: 0.02 MGD **pH: 7.4 s.u.** **DO: 7.5 mg/L**
BOD5: 9.3 mg/L **TSS: 10.8 mg/L** **Ammonia-N: 0.25 mg/L**
TRC, contact: 1.6 mg/L **TRC, final: <QL**

2nd Quarter average: **April – June 2011**

Flow: 0.019 MGD **pH: 7.4 s.u.** **DO: 8.0 mg/L**
BOD5: 7.7 mg/L **TSS: 9.3 mg/L** **Ammonia-N: <0.15 mg/L**
TRC, contact: 1.6 mg/L **TRC, final: < QL**

DATA VERIFIED IN PREFACE [X] Updated [ ] No changes

Has there been any new construction? [ ] Yes [X] No

If yes, were plans and specifications approved? [ ] Yes [ ] No [X] NA

DEQ approval date: **NA**

(A) PLANT OPERATION AND MAINTENANCE

1. Class and number of licensed operators: I - **0** II - **0** III - **1** IV - **0** Trainee - **0**

2. Hours per day plant is manned: **0630 – 1500 during the primary operator's work days; staff from nearby institutions cover on his days off.**

3. Describe adequacy of staffing. [ ] Good [**X**] Average [ ] Poor

4. Does the plant have an established program for training personnel? [**X**] Yes [ ] No

5. Describe the adequacy of the training program. [ ] Good [**X**] Average [ ] Poor

6. Are preventive maintenance tasks scheduled? [ ] Yes [ ] No

7. Describe the adequacy of maintenance. [ ] Good [**X**] Average [ ] Poor*

8. Does the plant experience any organic/hydraulic overloading? [**X**] Yes [ ] No

   If yes, identify cause and impact on plant: **I&I. Flows are usually contained in the holding tank, but the plant has experienced occasional overflows.**

9. Any bypassing since last inspection? [ ] Yes [**X**] No

10. Is the standby electric generator operational? [**X**] Yes [ ] No* [ ] NA

11. Is the STP alarm system operational? [**X**] Yes [ ] No* [ ] NA

12. How often is the standby generator exercised? **Once per week under load**
    Power Transfer Switch?
    Alarm System?

13. When was the cross connection control device last tested on the potable water service? **July 2010.**

14. Is sludge being disposed in accordance with the approved sludge disposal plan? [**X**] Yes [ ] No [ ] NA

15. Is septage received by the facility? [ ] Yes [**X**] No
    Is septage loading controlled? [ ] Yes [ ] No NA [**X**]
    Are records maintained? [ ] Yes [ ] No NA [**X**]

16. Overall appearance of facility: [ ] Good [**X**] Average [ ] Poor

Comments:

4. Operators take classes for continuing education credits through the Virginia Rural Water Association.

8. The plant does experience high flows attributed to Inflow and Infiltration (I&I). Flows can overwhelm the plant pump station, resulting in water backing up into the drying beds or sand filter. Hydraulic overloading has also led to solids washing out of the plant through Outfall 001.

13. The thermometer check was due in July 2011. Mr. Hardesty stated he would call EI Tech to come out and certify this as well as the thermisters on the pH and DO meters.

14. A revised sludge management plan was received by DEQ Nov 28, 2007.

(B) PLANT RECORDS

1. Which of the following records does the plant maintain?

Operational Logs for each unit process	[X] Yes	[ ] No	[ ] NA
Instrument maintenance and calibration	[X] Yes	[ ] No	[ ] NA
Mechanical equipment maintenance	[X] Yes	[ ] No	[ ] NA
Industrial waste contribution (Municipal Facilities)	[ ] Yes	[ ] No	[X] NA

2. What does the operational log contain?

[X] Visual observations	[ ] Flow measurement
[X] Laboratory results	[X] Process adjustments
[ ] Control calculations	[ ] Other (specify)

Comments:

3. What do the mechanical equipment records contain?

[ ] As built plans and specs	[ ] Spare parts inventory
[X] Manufacturers instructions	[X] Equipment/parts suppliers
[X] Lubrication schedules	[ ] Other (specify)

Comments:

4. What do the industrial waste contribution records contain (Municipal Only)? **NA**

[ ] Waste characteristics	[ ] Locations and discharge types
[ ] Impact on plant	[ ] Other (specify)

Comments:

5. Which of the following records are kept at the plant and available to personnel?

[X] Equipment maintenance records	[X] Operational Log
[ ] Industrial contributor records	[ ] Instrumentation records
[X] Sampling and testing records	

6. Records not normally available to plant personnel and their location: **Copies of records are kept at the DOC Headquarters**

7. Were the records reviewed during the inspection? [X] Yes [ ] No

8. Are the records adequate and the O & M Manual current? [ ] Yes [X] No

9. Are the records maintained for the required 3-year time period? [X] Yes [ ] No

Comments:

3. Mr. Hardesty stated that there are no spare parts on site except one blower.

8. The O&M manual is out of date.

9. Facility now submits DMR via eDMR.

(C) SAMPLING

1. Do sampling locations appear to be capable of providing representative samples? [X] Yes [ ] No*
2. Do sample types correspond to those required by the VPDES permit? [X] Yes [ ] No*
3. Do sampling frequencies correspond to those required by the VPDES permit? [X] Yes [ ] No*
4. Are composite samples collected in proportion to flow? [ ] Yes [ ] No* [X] NA
5. Are composite samples refrigerated during collection? [ ] Yes [ ] No* [X] NA
6. Does plant maintain required records of sampling? [X] Yes [ ] No*
7. Does plant run operational control tests? [X] Yes [ ] No

Comments:

(D) TESTING

1. Who performs the testing? [X] Plant [X] Central Lab [ ] Commercial Lab

   Name: **Plant- DO, pH, TRC**
   Haynesville Correctional Center WWTP Lab - BOD_5, TSS
   Air, Water, Soil Laboratories, Inc – Ammonia-N

If plant performs any testing, complete 2-4.

2. What method is used for chlorine analysis? **Hach Pocket Colorimeter**
3. Does plant appear to have sufficient equipment to perform required tests? [X] Yes [ ] No*
4. Does testing equipment appear to be clean and/or operable? [X] Yes [ ] No*

Comments:

(E) FOR INDUSTRIAL FACILITIES WITH TECHNOLOGY BASED LIMITS ONLY

1. Is the production process as described in the permit application? (If no, describe changes in comments)
   [ ] Yes [ ] No [X] NA
2. Do products and production rates correspond as provided in the permit application? (If no, list differences)
   [ ] Yes [ ] No [X] NA
3. Has the State been notified of the changes and their impact on plant effluent? Date:
   [ ] Yes [ ] No* [X] NA

Comments:

VPDES NO. **VA0023329**

UNIT PROCESS: Screening/Comminution

1.	Number of Units:	Manual:	**2**	Mechanical:	**0**
	Number in operation:	Manual:	**2**	Mechanical:	**0**
2.	Bypass channel provided:		[ ] Yes	[**X**] No*	
	Bypass channel in use:		[ ] Yes	[ ] No	NA [**X**]
3.	Area adequately ventilated:		[**X**] Yes	[ ] No*	
4.	Alarm system for equipment failure or overloads:		[ ] Yes	[**X**] No*	
5.	Proper flow distribution between units:		[**X**] Yes	[ ] No	[ ] NA
6.	How often are units checked and cleaned?		**Checked daily, cleaned every other day.**		
7.	Cycle of operation:		**Continuous**		
8.	Volume of screenings removed:		**Couple of pounds at a time.**		
9.	General condition:		[**X**] Good	[ ] Fair	[ ] Poor

Comments:

4. There is an alarm at the plant pump station downstream from the bar screen.

UNIT PROCESS: Flow Equalization –Holding Tank

1. Type: [ ] In-line [X] Side-line [ ] Spill pond — Number of cells:
2. What unit process does it precede? **Oxidation Ditch**
3. Is volume adequate? [X] Yes [ ] No
4. Mixing: [ ] None [X] Diffused air [ ] Fixed mechanical [ ] Floating mechanical
5. Condition of mixing equipment: [X] Good [ ] Average [ ] Poor
6. How drawn off?
   A. Pumped from: [ ] Surface [X] Sub-surface [ ] Adjustable
   B. Weir [ ] Surface [ ] Sub-surface
7. Is containment structure in good condition? [X] Yes [ ] No
8. Are the facilities to flush solids and grease from basin walls adequate? [X] Yes [ ] No [ ] NA
9. Are there facilities for withdrawing floating material and foam? [ ] Yes [X] No
10. How are solids removed? [X] Drain down [ ] Drag line [ ] NA [ ] Other

    Is it adequate? [X] Yes [ ] No
11. Is the emergency overflow in good condition? [ ] Yes [ ] No [X] NA
12. Are the depth gauges in good condition? [X] Yes [ ] No [ ] NA

Comments:

2. **This tank can only be pumped down to the two foot mark. Can't pump lower because pump intakes are then above the water level.**

6. **Structure has two pumps that operate alternately.**

- **Pumped down and cleaned every other year; Mr. Hardesty thought this was last done summer 2010.**

VPDES NO. **VA0023329**

UNIT PROCESS: Activated Sludge Aeration

1. Number of units: **1** In operation: **1**

2. Mode of operation: **Oxidation Ditch - Extended Aeration Activated Sludge**

3. Proper flow distribution between units: [ ] Yes [ ] No* [**X**] NA

4. Foam control operational: [ ] Yes [ ] No* [**X**] NA

5. Scum control operational: [ ] Yes [ ] No* [**X**] NA

6. Evidence of following problems:
   a. dead spots [ ] Yes* [**X**] No
   b. excessive foam [ ] Yes* [**X**] No
   c. poor aeration [ ] Yes* [**X**] No
   d. excessive aeration [ ] Yes* [**X**] No
   e. excessive scum [ ] Yes* [**X**] No
   f. aeration equipment malfunction [ ] Yes* [**X**] No
   g. other (identify in comments) [ ] Yes* [**X**] No

7. Mixed liquor characteristics (as available):

   Color: **Light brown**
   Odor: **None**

8. Return/waste sludge:
   A. Return Rate: **Continuous**
   b. Waste Rate: **Not Measured**
   c. Frequency of Wasting: **about 30 minutes at a time, three times a week**

9. Aeration system control: [**X**] Time Clock [ ] Manual [ ] Continuous [ ] Other (explain)

10. Effluent control devices working properly (oxidation ditches): [**X**] Yes [ ] No* [ ] NA

11. General condition: [ ] Good [**X**] Fair [ ] Poor

Comments:

- **Blowers are set for 60 minutes on, 15 minutes off, and operate alternately.**

- **The valve for WAS line is not functioning correctly. Must be kept at certain position or does not close properly. While Mr. Hardesty was on vacation, the valve was shifted, resulting in a slow continuous flow for sludge to the digester (WAS) and little to none returned to the oxidation ditch. As a result, the mixed liquor in oxidation ditch was very thin and the plant had a young sludge. Operators are working to bring the solids back up.**

UNIT PROCESS: Sedimentation

[ ] Primary [X] Secondary [ ] Tertiary

1.	Number of units: **1**	In operation: **1**		
2.	Proper flow distribution between units:	[ ] Yes	[ ] No*	[X] NA
3.	Signs of short circuiting and/or overloads:	[ ] Yes	[X] No	
4.	Effluent weirs level: Clean:	[X] Yes [X] Yes	[ ] No* [ ] No*	
5.	Scum collection system working properly:	[ ] Yes	[ ] No*	[ ] NA
6.	Sludge collection system working properly:	[ ] Yes	[X] No*	
7.	Influent, effluent baffle systems working properly:	[X] Yes	[ ] No*	
8.	Chemical addition: Chemicals:	[ ] Yes **NA**	[X] No	
9.	Effluent characteristics:	**Mostly clear, some solids being lost over weir**		
10.	General condition:	[ ] Good	[X] Fair	[ ] Poor

Comments:

- **Some rising sludge in clarifier**

6. **The Airlift which sends RAS back to the oxidation ditch was not working during this visit. Mr. Hardesty said has not been working for some time. Staff have been using the WAS pump and the 6" bypass line from the WAS pump to re-circulate RAS to the OD. The O&M manual indicates that this option should only be used for emergency operations.**

UNIT PROCESS: Filtration

1.	Type of filters:	[ ] Gravity	[ ] Pressure	[ ] Intermittent	
2.	Number of units:	In operation:			
3.	Operation of system:	[ ] Automatic	[ ] Semi-automatic	[ ] Manual	[ ] Other (specify)
4.	Proper flow distribution between units:	[ ] Yes	[ ] No*	[ ] NA	
5.	Evidence of following problems:				
	a. uneven flow distribution	[ ] Yes*	[ ] No		
	b filter clogging (ponding)	[ ] Yes*	[ ] No		
	c. nozzles clogging	[ ] Yes*	[ ] No		
	d. icing	[ ] Yes*	[ ] No		
	e. filter flies	[ ] Yes*	[ ] No		
	f. vegetation on filter	[ ] Yes*	[ ] No		
6.	Filter aid system provided:	[ ] Yes	[ ] No		
	Properly operating:	[ ] Yes	[ ] No	[ ] NA	
	Chemical used:				
7.	Automatic valves properly operating:	[ ] Yes*	[ ] No*	[ ] NA	
8.	Valves sequencing correctly:	[ ] Yes*	[ ] No*	[ ] NA	
9.	Backwash system operating properly:	[ ] Yes*	[ ] No*	[ ] NA	
10.	Filter building adequately ventilated:	[ ] Yes*	[ ] No*	[ ] NA	
11.	Effluent characteristics:				
12.	General condition:	[ ] Good	[ ] Fair	[ ] Poor	

Comments:

- **The sand filter is off line and has been for several years. Staff believes it was removed from service about 5 years ago. The Technical Inspection Report for this facility dated December 18, 2006 indicated that the sand filter was in use in November 2006.**

UNIT PROCESS: Chlorination

1 No. of chlorinators: **1** In operation: **1**

2. No. of evaporators: In operation:

3. No. of chlorine contact tanks: **1** In operation: **1**

4. Proper flow distribution between units: [ ] Yes [ ] No* [**X**] NA

5. How is chlorine introduced into the wastewater?
   [ ] Perforated diffusers
   [ ] Injector with single entry point
   [**X**] Other **Tablet Feeder**

6. Chlorine residual in basin effluent: **>2.2 mg/L**

7. Applied chlorine dosage: **Tubes topped off daily- add about 6 tablets per day.**

8. Contact basins adequately baffled: [**X**] Yes [ ] No*

9. Adequate ventilation:
   a. cylinder storage area [ ] Yes [ ] No* NA [**X**]
   b. equipment room [ ] Yes [ ] No* NA [**X**]

10. Proper safety precautions used: [**X**] Yes [ ] No*

11. General condition: [**X**] Good [ ] Fair [ ] Poor

Comments:

- **There were solids settled in the small tank/chamber just prior to chlorine tablet feeder and just downstream of tablet feeder in chlorine contact tank.**

UNIT PROCESS: Dechlorination

1. Chemical used: [ ] Sulfur Dioxide [ ] Bisulfite [X] Other **Sodium Sulfite**
2. No. of sulfonators: In operation:
3. No. of evaporators: In operation:
4. No. of chemical feeders: In operation:
5. No. of contact tanks: **1** In operation: **1**
6. Proper flow distribution between units: [ ] Yes [ ] No* [X] NA
7. How is chemical introduced into the wastewater?
   [ ] Perforated diffusers
   [ ] Injector with single entry point
   [X] Other **Tablet Feeder**
8. Control system operational: [ ] Yes [ ] No* NA [X]
   a. residual analyzers: [ ] Yes [ ] No* NA [X]
   b. system adjusted: [ ] Automatic [ ] Manual [ ] Other:
9. Applied dechlorination dose: **Topped off daily- about 20 tablets per day**
10. Chlorine residual in basin effluent: **>2.2 mg/L**
11. Contact basins adequately baffled: [ ] Yes [ ] No* [X] NA
12. Adequate ventilation:
    a. cylinder storage area: [ ] Yes [ ] No* NA [X]
    b. equipment room: [ ] Yes [ ] No* NA [X]
13. Proper safety precautions used: [X] Yes [ ] No*
14. General condition: [X] Good [ ] Fair [ ] Poor

Comments:

10. Plant had recently run out of dechlorination tablets, and Mr. Hardesty was using some borrowed from another facility. He made the observation that they do not seem to dissolve as quickly. When TRC was analyzed, it showed residual > 2.2 mg/L. Mr. Hardesty when out and shook dechlor tubes down again. When we went out to collect lab samples, evidence of dechlor tablet pieces at the outfall was observed; when Mr. Hardesty resampled the final effluent, the TRC was < 0.1 mg/L.

Mr. Phillips informed me on August 12th that the operators have continued to record low levels of total residual chlorine in the plant effluent, that are none the less above the QL of 0.1 mg/L. Staff is investigating the cause of these permit exceedences and are attempting to correct the problem.

11. The dechlorination tablet feeder is located at the head of the post- aeration tank.

UNIT PROCESS: Post Aeration - Tank

1. Number of units: **1** In operation: **1**

2. Proper flow distribution between units: [ ] Yes [ ] No* [X] NA

3. Evidence of following problems:
   a. dead spots [ ] Yes* [X] No
   b. excessive foam [ ] Yes* [X] No
   c. poor aeration [ ] Yes* [X] No
   d. mechanical equipment failure [ ] Yes* [X] No [ ] NA

4. How is the aerator controlled? [X] Time clock [ ] Manual [ ] Continuous [ ] Other* [ ] NA

5. What is the current operating schedule? **6o minutes on, 15 minutes off**

6. Step weirs level: [X] Yes [ ] No [ ] NA

7. Effluent D.O. level: **7.00 mg/L**

8. General condition: [X] Good [ ] Fair [ ] Poor

Comments:

5. The post aeration tank is aerated by the same blowers as aeration basin. There is also a step cascade structure below Outfall 001.

UNIT PROCESS: Flow Measurement

[ ] Influent [ ] Intermediate [X] Effluent

1. Type measuring device:

2. Present reading:

3. Bypass channel: [ ] Yes [ ] No
   Metered: [ ] Yes [ ] No

4. Return flows discharged upstream from meter: [ ] Yes [ ] No
   Identify:

5. Device operating properly: [ ] Yes [ ] No*

6. Date of last calibration:

7. Evidence of following problems:

   a. obstructions [ ] Yes* [ ] No
   b. grease [ ] Yes* [ ] No

8. General condition: [ ] Good [ ] Fair [ ] Poor

Comments:

- **Flow is estimated from the potable water meter minus amount used for agriculture.**

UNIT PROCESS: Effluent/Plant Outfall

1.	Type Outfall	[**X**] Shore based		[ ] Submerged	
2.	Type if shore based:	[ ] Wingwall		[**X**] Headwall	[ ] Rip Rap
3.	Flapper valve:	[ ] Yes	[ ] No	[**X**] NA	
4.	Erosion of bank:	[ ] Yes	[**X**] No	[ ] NA	
5.	Effluent plume visible?	[ ] Yes*	[**X**] No		
6.	Condition of outfall and supporting structures:			[ ] Good	[**X**] Fair [ ] Poor*
7.	Final effluent, evidence of following problems:				
	a. oil sheen	[ ] Yes*	[**X**] No		
	b. grease	[ ] Yes*	[**X**] No		
	c. sludge bar	[ ] Yes*	[**X**] No		
	d. turbid effluent	[**X**] Yes*	[ ] No		
	e. visible foam	[ ] Yes*	[**X**] No		
	f. unusual color	[ ] Yes*	[**X**] No		

Comments:

4. A truckload of large rocks was added to the outfall area (side and below Outfall 001) a few years ago to help prevent erosion. This area receives a large amount of sheet flow form stormwater run-off.

7. Effluent had a brownish tinge.

UNIT PROCESS: Aerobic Digestion

1. Number of units: **1**	In operation: **1**		
2. Type of sludge treated	[ ] Primary	[X] WAS	[ ] Other
3. Frequency of sludge application to digesters:	**Three times a week**		
4. Supernatant return rate:	**Not measured**		
5. pH adjustment provided:	[ ] Yes	[X] No	
Utilized:	[ ] Yes	[ ] No	[X] NA
6. Tank contents well-mixed and relatively free of odors:		[X] Yes	[ ] No*
7. If diffused aeration is used, do diffusers require frequent cleaning?	[ ] Yes	[X] No	[ ] NA
8. Location of supernatant return:	[X] Head	[ ] Primary	[ ] Other
9. Process control testing:			
a. reduction of volatile solids	[ ] Yes	[X] No	
b. pH	[ ] Yes	[X] No	
c. alkalinity	[ ] Yes	[X] No	
d. dissolved oxygen	[ ] Yes	[X] No	
10. Foaming problem present:	[ ] Yes*	[X] No	
11. Signs of short-circuiting or overloads:	[ ] Yes*	[X] No	
12. General condition:	[X] Good	[ ] Fair	[ ] Poor

Comments:

- **Before wasting to the drying beds, blowers are turned off and solids settle, supernatant is decanted from top, and then blowers turned on again to repeat cycle several times. Aluminum sulfate is added when running the 6th cycle of settle/decant.**

UNIT PROCESS: Drying Beds

1. Number of units: **2** In operation: **1**
2. Cover in good condition: [ ] Yes [ ] No* [**X**] NA
3. Typical sand depth in beds: **Unknown**
4. Typical drying time: **60 days**
5. Frequency of usage: **Once every 2-3 months**
6. Underflow recycle location: **Plant pump station**
7. Sludge distributed evenly across bed(s): [**X**] Yes [ ] No*
8. Following problems noted:

a. odors	[ ] Yes*	[**X**] No
b. flies	[ ] Yes*	[**X**] No
c. weed growth	[ ] Yes*	[**X**] No
d. leakage from bed(s)	[ ] Yes*	[**X**] No

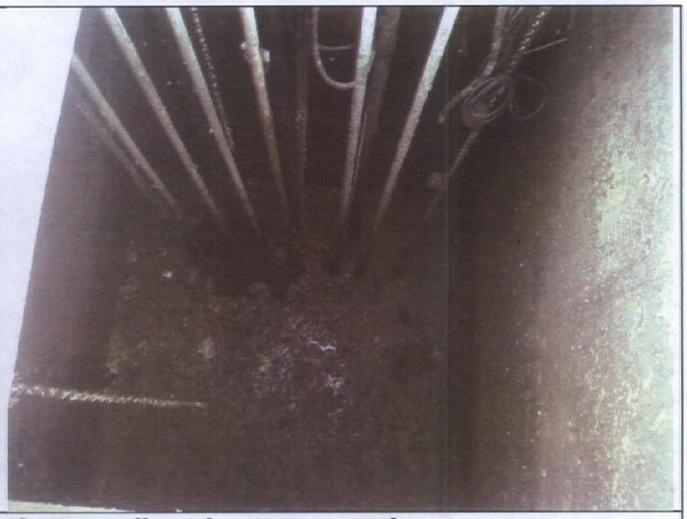
9. If the facility does not have an approved sludge plan, what is the current method of sludge disposal? **NA**
10. General condition: [**X**] Good [ ] Fair [ ] Poor

Comments:

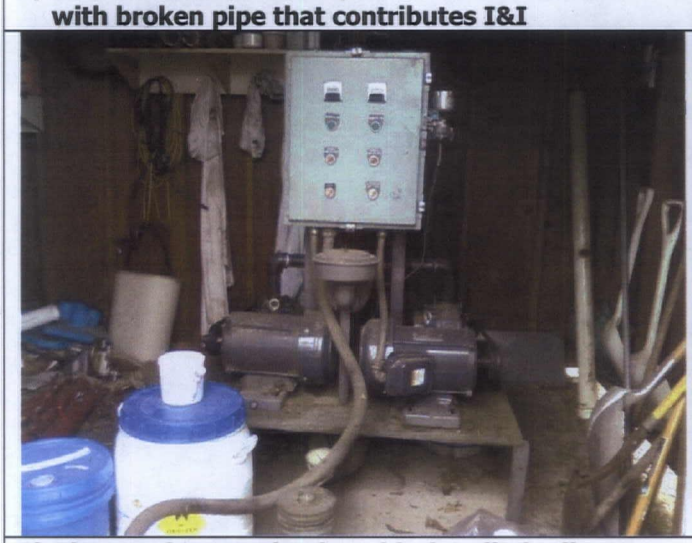
3. New sand was added last summer; four tons to each drying bed.

9. A new sludge management plan was submitted to DEQ in 2007. Dewatered biosolids are stored on site in a covered dumpster. When full, the solids are picked up by DOC staff and land applied on Department of Corrections property in Powhatan County. Mr. Hardesty said it takes a couple of years to fill the dumpster.

1) Headworks and view up hill above headworks with broken pipe that contributes I&I

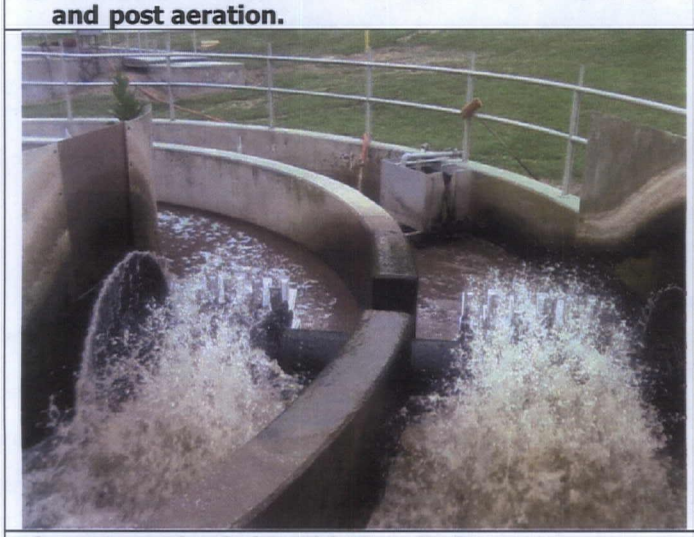


2) Wet well at plant pump station.

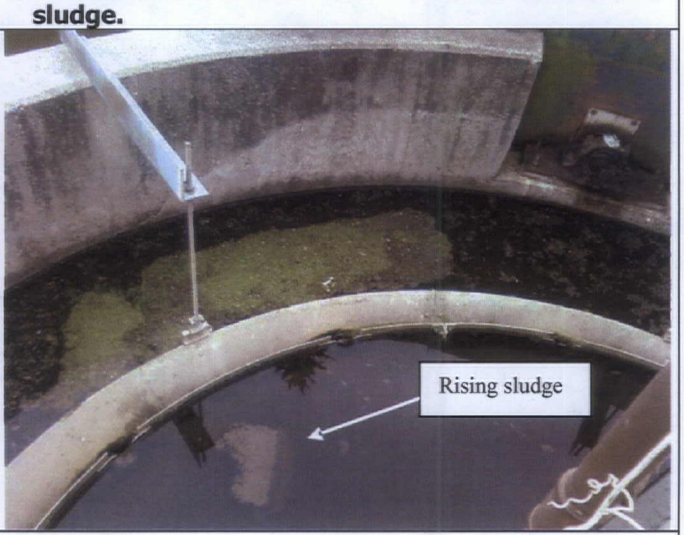


3) Blowers for aeration in oxidation ditch, digester, and post aeration.

4) Oxidation ditch- crisp white foam indicates young sludge.



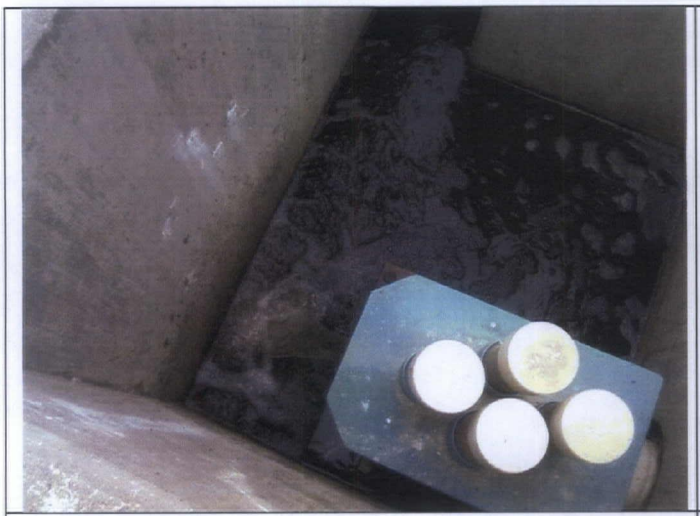
5) Aerator wheels in oxidation ditch.



6) Clarifier.

Facility name: Caroline Correctional Facility Unit 2
Site Inspection Date: July 19, 2011

VPDES Permit No. VA0023329
Photos & Layout by: S. Allen

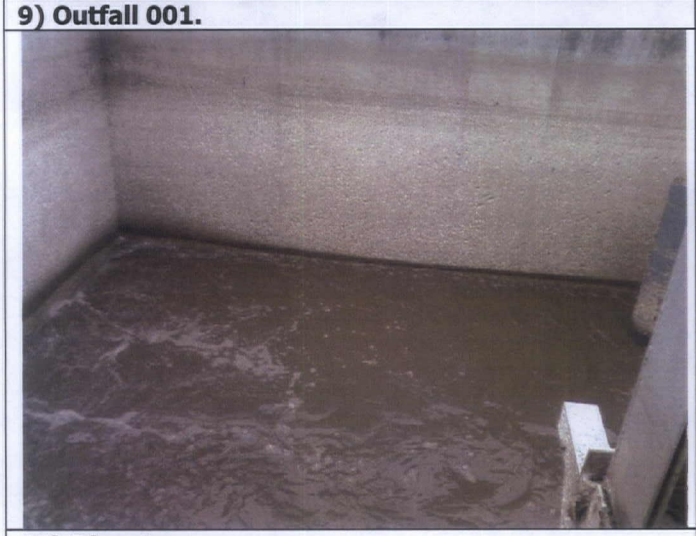


7) Chlorination.

8) Post aeration.

9) Outfall 001.

10) Discharge path to receiving stream.



11) Digester.

12) Sludge drying beds and solids storage dumpster.

ATTACHMENT 5

Planning Statement

To:	Douglas Frasier
From:	Jennifer Carlson
Date:	16 July 2015
Subject:	Planning Statement for Caroline Correctional Unit #2
Permit Number:	VA0023329

Information for Outfall 001:

Discharge Type:	minor, municipal
Discharge Flow:	0.037 MGD
Receiving Stream:	Herring Creek, UT
Latitude / Longitude:	37° 50' 07" / -77° 19' 42"
Rivermile:	0.28
Streamcode:	8-XDF
Waterbody:	VAN-F21R
Water Quality Standards:	Class III, Section 3, no special standards
Drainage Area:	0.02 square miles

1. Please provide water quality monitoring information for the receiving stream segment. If there is not monitoring information for the receiving stream segment, please provide information on the nearest downstream monitoring station, including how far downstream the monitoring station is from the outfall.

   This facility discharges into an unnamed tributary to Herring Creek, which has not been monitored or assessed. The portion of Herring Creek to which this unnamed tributary flows has a freshwater probabilistic monitoring station 8-HER012.99, last sampled in 2002 and is located 1.7 miles downstream of the confluence or approximately 2 miles downstream of Outfall 001. This station is located downstream of the Route 601 bridge. The following is the water quality summary for this segment of Herring Creek as taken from the 2012 Integrated Report:

   Class VII, Section 3

   DEQ monitoring station located in this segment of Herring Creek:
   - *Freshwater probabilistic monitoring station 8-HER012.99, downstream of Route 601*

   Biological monitoring indicates that the aquatic life use is not supporting. The wildlife use is considered fully supporting. The fish consumption and recreation uses were not assessed.

   The nearest downstream DEQ ambient water quality monitoring station is located at the Route 609 bridge. Station 8-HER005.12 is located approximately 11 miles downstream of Outfall 001. The following is the water quality summary for this segment of Herring Creek as taken from the 2012 Integrated Report:

   Class VII, Section 3

   DEQ monitoring station located in this segment of Herring Creek:
   - *Ambient monitoring station 8-HER005.12, at Route 609*

The recreation, aquatic life, and wildlife uses are considered fully supporting.

The fish consumption use is categorized as impaired due to a Virginia Department of Health, Division of Health Hazards Control, mercury fish consumption advisory. Additionally, five exceedances of the fish tissue value (TV) of 300 parts per billion (ppb) for mercury (Hg) in fish tissue was recorded in five species of fish samples collected in 2003 at monitoring station 8-HER005.12 (bluegill sunfish, chain pickerel, flier sunfish, largemouth bass, yellow bullhead catfish).

2. Does this facility discharge to a stream segment on the 303(d) list? If yes, please fill out Table A.

   No.

3. Are there any downstream 303(d) listed impairments that are relevant to this discharge? If yes, please fill out Table B.

   Yes.

Table B. Information on Downstream 303(d) Impairments and TMDLs

Waterbody Name	Impaired Use	Cause	Distance From Outfall (miles)	TMDL completed	WLA	Basis for WLA	TMDL Schedule
Impairment Information in the 2012 Integrated Report							
Herring Creek	Aquatic Life	Benthic Macroinvertebrates	0.28	No	--	--	2020
	Fish Consumption	Mercury	9	No	--	--	2018
Mattaponi River	Fish Consumption	PCBs	16	No	--	--	2022

4. Is there monitoring or other conditions that Planning/Assessment needs in the permit?

   Herring Creek, which is located approximately 0.28 miles downstream from Outfall 001, is listed as impaired for benthic macroinvertebrates with no TMDL in place. Because this municipal facility is located within five miles upstream from a benthic impairment, it is a candidate for nutrient monitoring. DEQ staff requests the facility conduct quarterly nutrient monitoring, specifically for total phosphorus, nitrate, nitrite, ammonia, and TKN.

   In support for the PCB impairment listed for Mattaponi River, this facility is a candidate for low-level PCB monitoring, based upon its designation as a minor municipal facility. Low-level PCB analysis uses EPA Method 1668, which is capable of detecting low-level concentrations for all 209 PCB congeners. DEQ staff has concluded that low-level PCB monitoring is not warranted for this facility, as it is a small wastewater treatment facility (<0.1 MGD) and is not expected to be a source of PCBs. Additionally, fish tissue samples have been collected in the Herring Creek in 2003 between the discharge location and the downstream Mattaponi impaired segment. Results from this sampling show no exceedances of the fish tissue criterion for PCBs. Based upon this information, this facility will not be requested to monitor for low-level PCBs.

There is a completed downstream TMDL for the aquatic life use impairment for the Chesapeake Bay. However, the Bay TMDL and the WLAs contained within the TMDL are not addressed in this planning statement.

5. Fact Sheet Requirements – Please provide information regarding any drinking water intakes located within a 5 mile radius of the discharge point.

   There are no public water supply intakes located within 5 miles of this discharge.

ATTACHMENT 6

Water Quality Criteria / Wasteload Allocation Analysis

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: DOC-Caroline Correctional Unit #2 Permit No.: VA0023329

Receiving Stream: Herring Creek, UT Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) =	mg/L
90% Temperature (Annual) =	deg C
90% Temperature (Wet season) =	deg C
90% Maximum pH =	SU
10% Maximum pH =	SU
Tier Designation (1 or 2) =	1
Public Water Supply (PWS) Y/N? =	n
Trout Present Y/N? =	n
Early Life Stages Present Y/N? =	y

Stream Flows

1Q10 (Annual) =	0 MGD
7Q10 (Annual) =	0 MGD
30Q10 (Annual) =	0 MGD
1Q10 (Wet season) =	0 MGD
30Q10 (Wet season)	0 MGD
30Q5 =	0 MGD
Harmonic Mean =	0 MGD

Mixing Information

Annual - 1Q10 Mix =	100 %
- 7Q10 Mix =	100 %
- 30Q10 Mix =	100 %
Wet Season - 1Q10 Mix =	100 %
- 30Q10 Mix =	100 %

Effluent Information

Mean Hardness (as CaCO3) =	50 mg/L
90% Temp (Annual) =	25 deg C
90% Temp (Wet season) =	15 deg C
90% Maximum pH =	8.2 SU
10% Maximum pH =	7 SU
Discharge Flow =	0.037 MGD

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenapthene	0	--	--	na	9.9E+02	--	--	na	9.9E+02	--	--	--	--	--	--	--	--	--	--	na	9.9E+02
Acrolein	0	--	--	na	9.3E+00	--	--	na	9.3E+00	--	--	--	--	--	--	--	--	--	--	na	9.3E+00
Acrylonitrile[c]	0	--	--	na	2.5E+00	--	--	na	2.5E+00	--	--	--	--	--	--	--	--	--	--	na	2.5E+00
Aldrin[c]	0	3.0E+00	--	na	5.0E-04	3.0E+00	--	na	5.0E-04	--	--	--	--	--	--	--	--	3.0E+00	--	na	5.0E-04
Ammonia-N (mg/l) (Yearly)	0	5.73E+00	9.12E-01	na	--	5.73E+00	9.12E-01	na	--	--	--	--	--	--	--	--	--	5.73E+00	9.12E-01	na	--
Ammonia-N (mg/l) (High Flow)	0	5.73E+00	1.74E+00	na	--	5.73E+00	1.74E+00	na	--	--	--	--	--	--	--	--	--	5.73E+00	1.74E+00	na	--
Anthracene	0	--	--	na	4.0E+04	--	--	na	4.0E+04	--	--	--	--	--	--	--	--	--	--	na	4.0E+04
Antimony	0	--	--	na	6.4E+02	--	--	na	6.4E+02	--	--	--	--	--	--	--	--	--	--	na	6.4E+02
Arsenic	0	3.4E+02	1.5E+02	na	--	3.4E+02	1.5E+02	na	--	--	--	--	--	--	--	--	--	3.4E+02	1.5E+02	na	--
Barium	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Benzene[c]	0	--	--	na	5.1E+02	--	--	na	5.1E+02	--	--	--	--	--	--	--	--	--	--	na	5.1E+02
Benzidine[c]	0	--	--	na	2.0E-03	--	--	na	2.0E-03	--	--	--	--	--	--	--	--	--	--	na	2.0E-03
Benzo (a) anthracene[c]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Benzo (b) fluoranthene[c]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Benzo (k) fluoranthene[c]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Benzo (a) pyrene[c]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Bis2-Chloroethyl Ether[c]	0	--	--	na	5.3E+00	--	--	na	5.3E+00	--	--	--	--	--	--	--	--	--	--	na	5.3E+00
Bis2-Chloroisopropyl Ether	0	--	--	na	6.5E+04	--	--	na	6.5E+04	--	--	--	--	--	--	--	--	--	--	na	6.5E+04
Bis 2-Ethylhexyl Phthalate[c]	0	--	--	na	2.2E+01	--	--	na	2.2E+01	--	--	--	--	--	--	--	--	--	--	na	2.2E+01
Bromoform[c]	0	--	--	na	1.4E+03	--	--	na	1.4E+03	--	--	--	--	--	--	--	--	--	--	na	1.4E+03
Butylbenzylphthalate	0	--	--	na	1.9E+03	--	--	na	1.9E+03	--	--	--	--	--	--	--	--	--	--	na	1.9E+03
Cadmium	0	1.8E+00	6.6E-01	na	--	1.8E+00	6.6E-01	na	--	--	--	--	--	--	--	--	--	1.8E+00	6.6E-01	na	--
Carbon Tetrachloride[c]	0	--	--	na	1.6E+01	--	--	na	1.6E+01	--	--	--	--	--	--	--	--	--	--	na	1.6E+01
Chlordane[c]	0	2.4E+00	4.3E-03	na	8.1E-03	2.4E+00	4.3E-03	na	8.1E-03	--	--	--	--	--	--	--	--	2.4E+00	4.3E-03	na	8.1E-03
Chloride	0	8.6E+05	2.3E+05	na	--	8.6E+05	2.3E+05	na	--	--	--	--	--	--	--	--	--	8.6E+05	2.3E+05	na	--
TRC	0	1.9E+01	1.1E+01	na	--	1.9E+01	1.1E+01	na	--	--	--	--	--	--	--	--	--	1.9E+01	1.1E+01	na	--
Chlorobenzene	0	--	--	na	1.6E+03	--	--	na	1.6E+03	--	--	--	--	--	--	--	--	--	--	na	1.6E+03

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane[B]	0	--	--	na	1.3E+02	--	--	na	1.3E+02	--	--	--	--	--	--	--	--	--	--	na	1.3E+02
Chloroform	0	--	--	na	1.1E+04	--	--	na	1.1E+04	--	--	--	--	--	--	--	--	--	--	na	1.1E+04
2-Chloronaphthalene	0	--	--	na	1.6E+03	--	--	na	1.6E+03	--	--	--	--	--	--	--	--	--	--	na	1.6E+03
2-Chlorophenol	0	--	--	na	1.5E+02	--	--	na	1.5E+02	--	--	--	--	--	--	--	--	--	--	na	1.5E+02
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	8.3E-02	4.1E-02	na	--	--	--	--	--	--	--	--	--	8.3E-02	4.1E-02	na	--
Chromium III	0	3.2E+02	4.2E+01	na	--	3.2E+02	4.2E+01	na	--	--	--	--	--	--	--	--	--	3.2E+02	4.2E+01	na	--
Chromium VI	0	1.6E+01	1.1E+01	na	--	1.6E+01	1.1E+01	na	--	--	--	--	--	--	--	--	--	1.6E+01	1.1E+01	na	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Chrysene[C]	0	--	--	na	1.8E-02	--	--	na	1.8E-02	--	--	--	--	--	--	--	--	--	--	na	1.8E-02
Copper	0	7.0E+00	5.0E+00	na	--	7.0E+00	5.0E+00	na	--	--	--	--	--	--	--	--	--	7.0E+00	5.0E+00	na	--
Cyanide, Free	0	2.2E+01	5.2E+00	na	1.6E+04	2.2E+01	5.2E+00	na	1.6E+04	--	--	--	--	--	--	--	--	2.2E+01	5.2E+00	na	1.6E+04
DDD[C]	0	--	--	na	3.1E-03	--	--	na	3.1E-03	--	--	--	--	--	--	--	--	--	--	na	3.1E-03
DDE[C]	0	--	--	na	2.2E-03	--	--	na	2.2E-03	--	--	--	--	--	--	--	--	--	--	na	2.2E-03
DDT[C]	0	1.1E+00	1.0E-03	na	2.2E-03	1.1E+00	1.0E-03	na	2.2E-03	--	--	--	--	--	--	--	--	1.1E+00	1.0E-03	na	2.2E-03
Demeton	0	--	1.0E-01	na	--	--	1.0E-01	na	--	--	--	--	--	--	--	--	--	--	1.0E-01	na	--
Diazinon	0	1.7E-01	1.7E-01	na	--	1.7E-01	1.7E-01	na	--	--	--	--	--	--	--	--	--	1.7E-01	1.7E-01	na	--
Dibenz(a,h)anthracene[C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
1,2-Dichlorobenzene	0	--	--	na	1.3E+03	--	--	na	1.3E+03	--	--	--	--	--	--	--	--	--	--	na	1.3E+03
1,3-Dichlorobenzene	0	--	--	na	9.6E+02	--	--	na	9.6E+02	--	--	--	--	--	--	--	--	--	--	na	9.6E+02
1,4-Dichlorobenzene	0	--	--	na	1.9E+02	--	--	na	1.9E+02	--	--	--	--	--	--	--	--	--	--	na	1.9E+02
3,3-Dichlorobenzidine[B]	0	--	--	na	2.8E-01	--	--	na	2.8E-01	--	--	--	--	--	--	--	--	--	--	na	2.8E-01
Dichlorobromomethane[C]	0	--	--	na	1.7E+02	--	--	na	1.7E+02	--	--	--	--	--	--	--	--	--	--	na	1.7E+02
1,2-Dichloroethane[C]	0	--	--	na	3.7E+02	--	--	na	3.7E+02	--	--	--	--	--	--	--	--	--	--	na	3.7E+02
1,1-Dichloroethylene	0	--	--	na	7.1E+03	--	--	na	7.1E+03	--	--	--	--	--	--	--	--	--	--	na	7.1E+03
1,2-trans-dichloroethylene	0	--	--	na	1.0E+04	--	--	na	1.0E+04	--	--	--	--	--	--	--	--	--	--	na	1.0E+04
2,4-Dichlorophenol	0	--	--	na	2.9E+02	--	--	na	2.9E+02	--	--	--	--	--	--	--	--	--	--	na	2.9E+02
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
1,2-Dichloropropane[B]	0	--	--	na	1.5E+02	--	--	na	1.5E+02	--	--	--	--	--	--	--	--	--	--	na	1.5E+02
1,3-Dichloropropene[C]	0	--	--	na	2.1E+02	--	--	na	2.1E+02	--	--	--	--	--	--	--	--	--	--	na	2.1E+02
Dieldrin[C]	0	2.4E-01	5.6E-02	na	5.4E-04	2.4E-01	5.6E-02	na	5.4E-04	--	--	--	--	--	--	--	--	2.4E-01	5.6E-02	na	5.4E-04
Diethyl Phthalate	0	--	--	na	4.4E+04	--	--	na	4.4E+04	--	--	--	--	--	--	--	--	--	--	na	4.4E+04
2,4-Dimethylphenol	0	--	--	na	8.5E+02	--	--	na	8.5E+02	--	--	--	--	--	--	--	--	--	--	na	8.5E+02
Dimethyl Phthalate	0	--	--	na	1.1E+06	--	--	na	1.1E+06	--	--	--	--	--	--	--	--	--	--	na	1.1E+06
Di-n-Butyl Phthalate	0	--	--	na	4.5E+03	--	--	na	4.5E+03	--	--	--	--	--	--	--	--	--	--	na	4.5E+03
2,4 Dinitrophenol	0	--	--	na	5.3E+03	--	--	na	5.3E+03	--	--	--	--	--	--	--	--	--	--	na	5.3E+03
2-Methyl-4,6-Dinitrophenol	0	--	--	na	2.8E+02	--	--	na	2.8E+02	--	--	--	--	--	--	--	--	--	--	na	2.8E+02
2,4-Dinitrotoluene[C]	0	--	--	na	3.4E+01	--	--	na	3.4E+01	--	--	--	--	--	--	--	--	--	--	na	3.4E+01
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	na	5.1E-08	--	--	na	5.1E-08	--	--	--	--	--	--	--	--	--	--	na	5.1E-08
1,2-Diphenylhydrazine[B]	0	--	--	na	2.0E+00	--	--	na	2.0E+00	--	--	--	--	--	--	--	--	--	--	na	2.0E+00
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	2.2E-01	5.6E-02	na	8.9E+01	--	--	--	--	--	--	--	--	2.2E-01	5.6E-02	na	8.9E+01
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	2.2E-01	5.6E-02	na	8.9E+01	--	--	--	--	--	--	--	--	2.2E-01	5.6E-02	na	8.9E+01
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	2.2E-01	5.6E-02	--	--	--	--	--	--	--	--	--	--	2.2E-01	5.6E-02	--	--
Endosulfan Sulfate	0	--	--	na	8.9E+01	--	--	na	8.9E+01	--	--	--	--	--	--	--	--	--	--	na	8.9E+01
Endrin	0	8.6E-02	3.6E-02	na	6.0E-02	8.6E-02	3.6E-02	na	6.0E-02	--	--	--	--	--	--	--	--	8.6E-02	3.6E-02	na	6.0E-02
Endrin Aldehyde	0	--	--	na	3.0E-01	--	--	na	3.0E-01	--	--	--	--	--	--	--	--	--	--	na	3.0E-01

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	na	2.1E+03	--	--	na	2.1E+03	--	--	--	--	--	--	--	--	--	--	na	2.1E+03
Fluoranthene	0	--	--	na	1.4E+02	--	--	na	1.4E+02	--	--	--	--	--	--	--	--	--	--	na	1.4E+02
Fluorene	0	--	--	na	5.3E+03	--	--	na	5.3E+03	--	--	--	--	--	--	--	--	--	--	na	5.3E+03
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Guthion	0	--	1.0E-02	na	--	--	1.0E-02	na	--	--	--	--	--	--	--	--	--	--	1.0E-02	na	--
Heptachlor[c]	0	5.2E-01	3.8E-03	na	7.9E-04	5.2E-01	3.8E-03	na	7.9E-04	--	--	--	--	--	--	--	--	5.2E-01	3.8E-03	na	7.9E-04
Heptachlor Epoxide[c]	0	5.2E-01	3.8E-03	na	3.9E-04	5.2E-01	3.8E-03	na	3.9E-04	--	--	--	--	--	--	--	--	5.2E-01	3.8E-03	na	3.9E-04
Hexachlorobenzene[c]	0	--	--	na	2.9E-03	--	--	na	2.9E-03	--	--	--	--	--	--	--	--	--	--	na	2.9E-03
Hexachlorobutadiene[c]	0	--	--	na	1.8E+02	--	--	na	1.8E+02	--	--	--	--	--	--	--	--	--	--	na	1.8E+02
Hexachlorocyclohexane Alpha-BHC[c]	0	--	--	na	4.9E-02	--	--	na	4.9E-02	--	--	--	--	--	--	--	--	--	--	na	4.9E-02
Hexachlorocyclohexane Beta-BHC[c]	0	--	--	na	1.7E-01	--	--	na	1.7E-01	--	--	--	--	--	--	--	--	--	--	na	1.7E-01
Hexachlorocyclohexane Gamma-BHC[c] (Lindane)	0	9.5E-01	na	na	1.8E+00	9.5E-01	--	na	1.8E+00	--	--	--	--	--	--	--	--	9.5E-01	--	na	1.8E+00
Hexachlorocyclopentadiene	0	--	--	na	1.1E+03	--	--	na	1.1E+03	--	--	--	--	--	--	--	--	--	--	na	1.1E+03
Hexachloroethane[c]	0	--	--	na	3.3E+01	--	--	na	3.3E+01	--	--	--	--	--	--	--	--	--	--	na	3.3E+01
Hydrogen Sulfide	0	--	2.0E+00	na	--	--	2.0E+00	na	--	--	--	--	--	--	--	--	--	--	2.0E+00	na	--
Indeno (1,2,3-cd) pyrene[c]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Iron	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Isophorone[c]	0	--	--	na	9.6E+03	--	--	na	9.6E+03	--	--	--	--	--	--	--	--	--	--	na	9.6E+03
Kepone	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	--
Lead	0	4.9E+01	5.6E+00	na	--	4.9E+01	5.6E+00	na	--	--	--	--	--	--	--	--	--	4.9E+01	5.6E+00	na	--
Malathion	0	--	1.0E-01	na	--	--	1.0E-01	na	--	--	--	--	--	--	--	--	--	--	1.0E-01	na	--
Manganese	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Mercury	0	1.4E+00	7.7E-01	--	--	1.4E+00	7.7E-01	--	--	--	--	--	--	--	--	--	--	1.4E+00	7.7E-01	--	--
Methyl Bromide	0	--	--	na	1.5E+03	--	--	na	1.5E+03	--	--	--	--	--	--	--	--	--	--	na	1.5E+03
Methylene Chloride[c]	0	--	--	na	5.9E+03	--	--	na	5.9E+03	--	--	--	--	--	--	--	--	--	--	na	5.9E+03
Methoxychlor	0	--	3.0E-02	na	--	--	3.0E-02	na	--	--	--	--	--	--	--	--	--	--	3.0E-02	na	--
Mirex	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	--
Nickel	0	1.0E+02	1.1E+01	na	4.6E+03	1.0E+02	1.1E+01	na	4.6E+03	--	--	--	--	--	--	--	--	1.0E+02	1.1E+01	na	4.6E+03
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Nitrobenzene	0	--	--	na	6.9E+02	--	--	na	6.9E+02	--	--	--	--	--	--	--	--	--	--	na	6.9E+02
N-Nitrosodimethylamine[c]	0	--	--	na	3.0E+01	--	--	na	3.0E+01	--	--	--	--	--	--	--	--	--	--	na	3.0E+01
N-Nitrosodiphenylamine[c]	0	--	--	na	6.0E+01	--	--	na	6.0E+01	--	--	--	--	--	--	--	--	--	--	na	6.0E+01
N-Nitrosodi-n-propylamine[c]	0	--	--	na	5.1E+00	--	--	na	5.1E+00	--	--	--	--	--	--	--	--	--	--	na	5.1E+00
Nonylphenol	0	2.8E+01	6.6E+00	--	--	2.8E+01	6.6E+00	na	--	--	--	--	--	--	--	--	--	2.8E+01	6.6E+00	na	--
Parathion	0	6.5E-02	1.3E-02	na	--	6.5E-02	1.3E-02	na	--	--	--	--	--	--	--	--	--	6.5E-02	1.3E-02	na	--
PCB Total[c]	0	--	1.4E-02	na	6.4E-04	--	1.4E-02	na	6.4E-04	--	--	--	--	--	--	--	--	--	1.4E-02	na	6.4E-04
Pentachlorophenol[c]	0	8.7E+00	6.7E+00	na	3.0E+01	8.7E+00	6.7E+00	na	3.0E+01	--	--	--	--	--	--	--	--	8.7E+00	6.7E+00	na	3.0E+01
Phenol	0	--	--	na	8.6E+05	--	--	na	8.6E+05	--	--	--	--	--	--	--	--	--	--	na	8.6E+05
Pyrene	0	--	--	na	4.0E+03	--	--	na	4.0E+03	--	--	--	--	--	--	--	--	--	--	na	4.0E+03
Radionuclides	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Gross Alpha Activity (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Beta and Photon Activity (mrem/yr)	0	--	--	na	4.0E+00	--	--	na	4.0E+00	--	--	--	--	--	--	--	--	--	--	na	4.0E+00
Radium 226 + 228 (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Uranium (ug/l)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	na	4.2E+03	2.0E+01	5.0E+00	na	4.2E+03	--	--	--	--	--	--	--	--	2.0E+01	5.0E+00	na	4.2E+03
Silver	0	1.0E+00	--	na	--	1.0E+00	--	na	--	--	--	--	--	--	--	--	--	1.0E+00	--	na	--
Sulfate	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
1,1,2,2-Tetrachloroethane[C]	0	--	--	na	4.0E+01	--	--	na	4.0E+01	--	--	--	--	--	--	--	--	--	--	na	4.0E+01
Tetrachloroethylene[C]	0	--	--	na	3.3E+01	--	--	na	3.3E+01	--	--	--	--	--	--	--	--	--	--	na	3.3E+01
Thallium	0	--	--	na	4.7E-01	--	--	na	4.7E-01	--	--	--	--	--	--	--	--	--	--	na	4.7E-01
Toluene	0	--	--	na	6.0E+03	--	--	na	6.0E+03	--	--	--	--	--	--	--	--	--	--	na	6.0E+03
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Toxaphene[C]	0	7.3E-01	2.0E-04	na	2.8E-03	7.3E-01	2.0E-04	na	2.8E-03	--	--	--	--	--	--	--	--	7.3E-01	2.0E-04	na	2.8E-03
Tributyltin	0	4.6E-01	7.2E-02	na	--	4.6E-01	7.2E-02	na	--	--	--	--	--	--	--	--	--	4.6E-01	7.2E-02	na	--
1,2,4-Trichlorobenzene	0	--	--	na	7.0E+01	--	--	na	7.0E+01	--	--	--	--	--	--	--	--	--	--	na	7.0E+01
1,1,2-Trichloroethane[C]	0	--	--	na	1.6E+02	--	--	na	1.6E+02	--	--	--	--	--	--	--	--	--	--	na	1.6E+02
Trichloroethylene[C]	0	--	--	na	3.0E+02	--	--	na	3.0E+02	--	--	--	--	--	--	--	--	--	--	na	3.0E+02
2,4,6-Trichlorophenol[C]	0	--	--	na	2.4E+01	--	--	na	2.4E+01	--	--	--	--	--	--	--	--	--	--	na	2.4E+01
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Vinyl Chloride[C]	0	--	--	na	2.4E+01	--	--	na	2.4E+01	--	--	--	--	--	--	--	--	--	--	na	2.4E+01
Zinc	0	6.5E+01	6.6E+01	na	2.6E+04	6.5E+01	6.6E+01	na	2.6E+04	--	--	--	--	--	--	--	--	6.5E+01	6.6E+01	na	2.6E+04

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information. Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	6.4E+02
Arsenic	9.0E+01
Barium	na
Cadmium	3.9E-01
Chromium III	2.5E+01
Chromium VI	6.4E+00
Copper	2.8E+00
Iron	na
Lead	3.4E+00
Manganese	na
Mercury	4.6E-01
Nickel	6.8E+00
Selenium	3.0E+00
Silver	4.2E-01
Zinc	2.6E+01

Note: do not use QL's lower than the minimum QL's provided in agency guidance

ATTACHMENT 7

Effluent pH Data
September 2010 to December 2014

DMR QA/QC

Permit #:VA0023329

Facility:DOC - Caroline Correctional Unit 2

Rec'd	Parameter Description	QTY AVG	Lim Avg	QTY MAX	Lim Max	CONC MIN	Lim Min	CONC AVG	Lim Avg	CONC MAX	Lim Max
08-Oct-2010	pH	NULL	**********	NULL	**********	7.2	6	NULL	**********	8.2	9
05-Nov-2010	pH	NULL	**********	NULL	**********	7.2	6	NULL	**********	8	9
06-Dec-2010	pH	NULL	**********	NULL	**********	7.2	6	NULL	**********	8.2	9
06-Jan-2011	pH	NULL	**********	NULL	**********	7	6	NULL	**********	8	9
09-Feb-2011	pH	NULL	**********	NULL	**********	6.8	6	NULL	**********	8	9
03-Mar-2011	pH	NULL	**********	NULL	**********	6.9	6	NULL	**********	7.4	9
08-Apr-2011	pH	NULL	**********	NULL	**********	7	6	NULL	**********	7.9	9
06-May-2011	pH	NULL	**********	NULL	**********	7	6	NULL	**********	8	9
08-Jun-2011	pH	NULL	**********	NULL	**********	6.9	6	NULL	**********	7.9	9
07-Jul-2011	pH	NULL	**********	NULL	**********	7	6	NULL	**********	8.2	9
08-Aug-2011	pH	NULL	**********	NULL	**********	7.3	6	NULL	**********	8.1	9
08-Sep-2011	pH	NULL	**********	NULL	**********	7.3	6	NULL	**********	8.2	9
06-Oct-2011	pH	NULL	**********	NULL	**********	7.1	6	NULL	**********	8	9
07-Nov-2011	pH	NULL	**********	NULL	**********	7	6	NULL	**********	8	9
09-Dec-2011	pH	NULL	**********	NULL	**********	7	6	NULL	**********	8	9
09-Jan-2012	pH	NULL	**********	NULL	**********	6.8	6	NULL	**********	8.5	9
08-Feb-2012	pH	NULL	**********	NULL	**********	6.9	6	NULL	**********	8.8	9
08-Mar-2012	pH	NULL	**********	NULL	**********	7.6	6	NULL	**********	7.9	9
06-Apr-2012	pH	NULL	**********	NULL	**********	7.1	6	NULL	**********	7.8	9
08-May-2012	pH	NULL	**********	NULL	**********	7	6	NULL	**********	7.8	9
06-Jun-2012	pH	NULL	**********	NULL	**********	6.3	6	NULL	**********	7.8	9
09-Jul-2012	pH	NULL	**********	NULL	**********	7.2	6	NULL	**********	8	9
06-Aug-2012	pH	NULL	**********	NULL	**********	7.2	6	NULL	**********	8.3	9
05-Sep-2012	pH	NULL	**********	NULL	**********	7	6	NULL	**********	8.6	9
09-Oct-2012	pH	NULL	**********	NULL	**********	7	6	NULL	**********	7.9	9
07-Nov-2012	pH	NULL	**********	NULL	**********	6.7	6	NULL	**********	7.8	9
06-Dec-2012	pH	NULL	**********	NULL	**********	7.2	6	NULL	**********	7.8	9
07-Jan-2013	pH	NULL	**********	NULL	**********	7.3	6	NULL	**********	7.7	9
06-Feb-2013	pH	NULL	**********	NULL	**********	7	6	NULL	**********	7.6	9
07-Mar-2013	pH	NULL	**********	NULL	**********	7.2	6	NULL	**********	7.7	9
05-Apr-2013	pH	NULL	**********	NULL	**********	7	6	NULL	**********	7.9	9
08-May-2013	pH	NULL	**********	NULL	**********	7.2	6	NULL	**********	7.9	9
07-Jun-2013	pH	NULL	**********	NULL	**********	7.1	6	NULL	**********	8.3	9
03-Jul-2013	pH	NULL	**********	NULL	**********	7.1	6	NULL	**********	7.6	9
07-Aug-2013	pH	NULL	**********	NULL	**********	7	6	NULL	**********	8	9
09-Sep-2013	pH	NULL	**********	NULL	**********	7	6	NULL	**********	7.8	9
07-Oct-2013	pH	NULL	**********	NULL	**********	7.3	6	NULL	**********	8.1	9

06-Dec-2013	pH	NULL	**********	NULL	**********	7.2	6	NULL	**********	8.1	9
08-Jan-2014	pH	NULL	**********	NULL	**********	7.1	6	NULL	**********	8	9
13-Jan-2014	pH	NULL	**********	NULL	**********	7.1	6	NULL	**********	7.8	9
10-Feb-2014	pH	NULL	**********	NULL	**********	7.3	6	NULL	**********	7.9	9
07-Mar-2014	pH	NULL	**********	NULL	**********	7.2	6	NULL	**********	7.9	9
09-Apr-2014	pH	NULL	**********	NULL	**********	7.1	6	NULL	**********	7.7	9
08-May-2014	pH	NULL	**********	NULL	**********	7.1	6	NULL	**********	7.9	9
10-Jun-2014	pH	NULL	**********	NULL	**********	7.2	6	NULL	**********	7.9	9
07-Jul-2014	pH	NULL	**********	NULL	**********	7.3	6	NULL	**********	8.2	9
08-Aug-2014	pH	NULL	**********	NULL	**********	7.3	6	NULL	**********	7.8	9
08-Sep-2014	pH	NULL	**********	NULL	**********	7.4	6	NULL	**********	8.5	9
08-Oct-2014	pH	NULL	**********	NULL	**********	7	6	NULL	**********	7.8	9
07-Nov-2014	pH	NULL	**********	NULL	**********	7.3	6	NULL	**********	7.8	9
04-Dec-2014	pH	NULL	**********	NULL	**********	7.2	6	NULL	**********	8	9
07-Jan-2015	pH	NULL	**********	NULL	**********	7.2	6	NULL	**********	7.8	9

90th Percentile of all data points: ***8.2***
10th Percentile of all data points: ***7***

ATTACHMENT 8

Effluent Data
September 2010 to December 2014

DMR QA/QC

Permit #:VA0023329

Facility:DOC - Caroline Correctional Unit 2

Rec'd	Parameter Description	QTY AVG	Lim Avg	QTY MAX	Lim Max	CONC MIN	Lim Min	CONC AVG	Lim Avg	CONC MAX	Lim Max
08-Oct-2010	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	1.3	<QL	1.3
05-Nov-2010	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	1.3	<QL	1.3
06-Dec-2010	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	1.3	<QL	1.3
06-Jan-2011	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	1.3	<QL	1.3
09-Feb-2011	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	1.3	<QL	1.3
03-Mar-2011	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.24	1.3	0.24	1.3
08-Apr-2011	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	1.3	<QL	1.3
06-May-2011	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	1.3	<QL	1.3
08-Jun-2011	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.1	1.3	0.1	1.3
07-Jul-2011	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.25	1.3	0.25	1.3
08-Aug-2011	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	1.3	<QL	1.3
08-Sep-2011	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	1.3	<QL	1.3
06-Oct-2011	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.74	1.3	0.74	1.3
07-Nov-2011	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	1.3	<QL	1.3
09-Dec-2011	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	1.3	<QL	1.3
09-Jan-2012	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.12	1.3	0.12	1.3
08-Feb-2012	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	1.3	<QL	1.3
08-Mar-2012	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	1.3	<QL	1.3
06-Apr-2012	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	1.3	<QL	1.3
08-May-2012	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	1.3	<QL	1.3
06-Jun-2012	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.2	1.3	0.2	1.3
09-Jul-2012	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.16	1.3	0.16	1.3
06-Aug-2012	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	1.3	<QL	1.3
05-Sep-2012	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.14	1.3	0.14	1.3
09-Oct-2012	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	1.3	<QL	1.3
07-Nov-2012	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.43	1.3	0.43	1.3
06-Dec-2012	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	1.3	<QL	1.3
07-Jan-2013	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	1.3	<QL	1.3
06-Feb-2013	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	1.3	<QL	1.3
07-Mar-2013	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	1.3	<QL	1.3
05-Apr-2013	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.14	1.3	0.14	1.3
08-May-2013	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	1.3	<QL	1.3
07-Jun-2013	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	1.3	<QL	1.3
03-Jul-2013	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	1.3	<QL	1.3
07-Aug-2013	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	1.3	<QL	1.3
09-Sep-2013	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	1.3	<QL	1.3
07-Oct-2013	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	1.3	<QL	1.3

06-Dec-2013	AMMONIA, AS N	NULL	*********	NULL	*********	NULL	*********	<QL	1.3	<QL	1.3
08-Jan-2014	AMMONIA, AS N	NULL	*********	NULL	*********	NULL	*********	0.01	1.3	0.01	1.3
13-Jan-2014	AMMONIA, AS N	NULL	*********	NULL	*********	NULL	*********	<QL	1.3	<QL	1.3
10-Feb-2014	AMMONIA, AS N	NULL	*********	NULL	*********	NULL	*********	5.1	1.3	8.4	1.3
07-Mar-2014	AMMONIA, AS N	NULL	*********	NULL	*********	NULL	*********	0.2	1.3	0.2	1.3
09-Apr-2014	AMMONIA, AS N	NULL	*********	NULL	*********	NULL	*********	<QL	1.3	<QL	1.3
08-May-2014	AMMONIA, AS N	NULL	*********	NULL	*********	NULL	*********	<QL	1.3	<QL	1.3
10-Jun-2014	AMMONIA, AS N	NULL	*********	NULL	*********	NULL	*********	<QL	1.3	<QL	1.3
07-Jul-2014	AMMONIA, AS N	NULL	*********	NULL	*********	NULL	*********	0.36	1.3	0.36	1.3
08-Aug-2014	AMMONIA, AS N	NULL	*********	NULL	*********	NULL	*********	1.1	1.3	2	1.3
08-Sep-2014	AMMONIA, AS N	NULL	*********	NULL	*********	NULL	*********	<QL	1.3	<QL	1.3
08-Oct-2014	AMMONIA, AS N	NULL	*********	NULL	*********	NULL	*********	<QL	1.3	<QL	1.3
07-Nov-2014	AMMONIA, AS N	NULL	*********	NULL	*********	NULL	*********	<QL	1.3	<QL	1.3
04-Dec-2014	AMMONIA, AS N	NULL	*********	NULL	*********	NULL	*********	0.32	1.3	0.32	1.3
07-Jan-2015	AMMONIA, AS N	NULL	*********	NULL	*********	NULL	*********	<QL	1.3	<QL	1.3
08-Oct-2010	BOD5	0.2	2.8	0.2	4.2	NULL	*********	2.7	20	2.7	30
05-Nov-2010	BOD5	0.75	2.8	0.75	4.2	NULL	*********	9.1	20	9.1	30
06-Dec-2010	BOD5	0.52	2.8	0.52	4.2	NULL	*********	8.2	20	8.2	30
06-Jan-2011	BOD5	0.32	2.8	0.32	4.2	NULL	*********	5	20	5	30
09-Feb-2011	BOD5	0.46	2.8	0.46	4.2	NULL	*********	6.6	20	6.6	30
03-Mar-2011	BOD5	0.43	2.8	0.43	4.2	NULL	*********	5.7	20	5.7	30
08-Apr-2011	BOD5	0.44	2.8	0.44	4.2	NULL	*********	6.5	20	6.5	30
06-May-2011	BOD5	0.37	2.8	0.37	4.2	NULL	*********	6.1	20	6.1	30
08-Jun-2011	BOD5	0.59	2.8	0.59	4.2	NULL	*********	7.86	20	7.86	30
07-Jul-2011	BOD5	0.7	2.8	0.7	4.2	NULL	*********	9.25	20	9.25	30
08-Aug-2011	BOD5	0.3	2.8	0.3	4.2	NULL	*********	5.65	20	5.65	30
08-Sep-2011	BOD5	0.36	2.8	0.36	4.2	NULL	*********	4.8	20	4.8	30
06-Oct-2011	BOD5	0.46	2.8	0.46	4.2	NULL	*********	6.1	20	6.1	30
07-Nov-2011	BOD5	0.16	2.8	0.16	4.2	NULL	*********	4.3	20	4.3	30
09-Dec-2011	BOD5	0.93	2.8	0.93	4.2	NULL	*********	8	20	8	30
09-Jan-2012	BOD5	0.67	2.8	0.067	4.2	NULL	*********	9.84	20	9.84	30
08-Feb-2012	BOD5	0.25	2.8	0.25	4.2	NULL	*********	3.87	20	3.87	30
08-Mar-2012	BOD5	0.16	2.8	0.16	4.2	NULL	*********	3.01	20	3.01	30
06-Apr-2012	BOD5	0.24	2.8	0.24	4.2	NULL	*********	3.2	20	3.2	30
08-May-2012	BOD5	0.91	2.8	0.91	4.2	NULL	*********	14.99	20	14.99	30
06-Jun-2012	BOD5	0.68	2.8	0.68	4.2	NULL	*********	10.55	20	10.55	30
09-Jul-2012	BOD5	0.78	2.8	0.78	4.2	NULL	*********	13.81	20	13.81	30
06-Aug-2012	BOD5	0.59	2.8	0.59	4.2	NULL	*********	9.78	20	9.78	30
05-Sep-2012	BOD5	0.14	2.8	0.14	4.2	NULL	*********	2.36	20	2.36	30
09-Oct-2012	BOD5	0.54	2.8	0.54	4.2	NULL	*********	8.92	20	8.92	30
07-Nov-2012	BOD5	0.28	2.8	0.28	4.2	NULL	*********	4.99	20	4.99	30
06-Dec-2012	BOD5	0.91	2.8	0.91	4.2	NULL	*********	13.41	20	13.41	30
07-Jan-2013	BOD5	0.66	2.8	0.66	4.2	NULL	*********	8.66	20	8.66	30

06-Feb-2013	BOD5	0.69	2.8	0.069	4.2	NULL	*********	8.65	20	8.65	30
07-Mar-2013	BOD5	0.38	2.8	0.38	4.2	NULL	*********	6.61	20	6.61	30
05-Apr-2013	BOD5	0.53	2.8	0.53	4.2	NULL	*********	8.2	20	8.2	30
08-May-2013	BOD5	0.39	2.8	0.39	4.2	NULL	*********	6.5	20	6.5	30
07-Jun-2013	BOD5	0.062	2.8	0.062	4.2	NULL	*********	10.3	20	10.3	30
03-Jul-2013	BOD5	0.45	2.8	0.45	4.2	NULL	*********	8	20	8	30
07-Aug-2013	BOD5	0.79	2.8	0.79	4.2	NULL	*********	15	20	15	30
09-Sep-2013	BOD5	0.6624	2.8	0.6624	4.2	NULL	*********	12.5	20	12.5	30
07-Oct-2013	BOD5	0.9023	2.8	0.9023	4.2	NULL	*********	14.9	20	14.9	30
06-Dec-2013	BOD5	1.2	2.8	1.2	4.2	NULL	*********	17	20	17	30
08-Jan-2014	BOD5	1.0492	2.8	1.0492	4.2	NULL	*********	15.4	20	15.4	30
13-Jan-2014	BOD5	1.1	2.8	1.6	4.2	NULL	*********	16.5	20	23.6	30
10-Feb-2014	BOD5	0.227	2.8	0.227	4.2	NULL	*********	4	20	4	30
07-Mar-2014	BOD5	0.6347	2.8	0.6347	4.2	NULL	*********	13	20	13	30
09-Apr-2014	BOD5	<QL	2.8	<QL	4.2	NULL	*********	<QL	20	<QL	30
08-May-2014	BOD5	0.14	2.8	0.14	4.2	NULL	*********	3	20	3	30
10-Jun-2014	BOD5	0.35	2.8	0.35	4.2	NULL	*********	5.2	20	5.2	30
07-Jul-2014	BOD5	0.28	2.8	0.28	4.2	NULL	*********	6.9	20	6.9	30
08-Aug-2014	BOD5	0.48	2.8	0.48	4.2	NULL	*********	7.1	20	7.1	30
08-Sep-2014	BOD5	0.57	2.8	0.57	4.2	NULL	*********	8.5	20	8.5	30
08-Oct-2014	BOD5	0.56	2.8	0.56	4.2	NULL	*********	7.8	20	7.8	30
07-Nov-2014	BOD5	0.28	2.8	0.28	4.2	NULL	*********	3.9	20	3.9	30
04-Dec-2014	BOD5	0.63	2.8	0.63	4.2	NULL	*********	8.8	20	8.8	30
07-Jan-2015	BOD5	0.37	2.8	0.37	4.2	NULL	*********	7	20	7	30
08-Oct-2010	DO	NULL	*********	NULL	*********	7.6	6.5	NULL	*********	NULL	*********
05-Nov-2010	DO	NULL	*********	NULL	*********	7.8	6.5	NULL	*********	NULL	*********
06-Dec-2010	DO	NULL	*********	NULL	*********	7.8	6.5	NULL	*********	NULL	*********
06-Jan-2011	DO	NULL	*********	NULL	*********	7.9	6.5	NULL	*********	NULL	*********
09-Feb-2011	DO	NULL	*********	NULL	*********	8.6	6.5	NULL	*********	NULL	*********
03-Mar-2011	DO	NULL	*********	NULL	*********	8.4	6.5	NULL	*********	NULL	*********
08-Apr-2011	DO	NULL	*********	NULL	*********	7.8	6.5	NULL	*********	NULL	*********
06-May-2011	DO	NULL	*********	NULL	*********	7.4	6.5	NULL	*********	NULL	*********
08-Jun-2011	DO	NULL	*********	NULL	*********	7.2	6.5	NULL	*********	NULL	*********
07-Jul-2011	DO	NULL	*********	NULL	*********	6.9	6.5	NULL	*********	NULL	*********
08-Aug-2011	DO	NULL	*********	NULL	*********	6.9	6.5	NULL	*********	NULL	*********
08-Sep-2011	DO	NULL	*********	NULL	*********	6.8	6.5	NULL	*********	NULL	*********
06-Oct-2011	DO	NULL	*********	NULL	*********	6.9	6.5	NULL	*********	NULL	*********
07-Nov-2011	DO	NULL	*********	NULL	*********	7.1	6.5	NULL	*********	NULL	*********
09-Dec-2011	DO	NULL	*********	NULL	*********	7	6.5	NULL	*********	NULL	*********
09-Jan-2012	DO	NULL	*********	NULL	*********	7	6.5	NULL	*********	NULL	*********
08-Feb-2012	DO	NULL	*********	NULL	*********	7.2	6.5	NULL	*********	NULL	*********
08-Mar-2012	DO	NULL	*********	NULL	*********	9.8	6.5	NULL	*********	NULL	*********
06-Apr-2012	DO	NULL	*********	NULL	*********	7	6.5	NULL	*********	NULL	*********

08-May-2012	DO	NULL	*********	NULL	*********	7	6.5	NULL	*********	NULL	*********
06-Jun-2012	DO	NULL	*********	NULL	*********	7.1	6.5	NULL	*********	NULL	*********
09-Jul-2012	DO	NULL	*********	NULL	*********	7	6.5	NULL	*********	NULL	*********
06-Aug-2012	DO	NULL	*********	NULL	*********	7	6.5	NULL	*********	NULL	*********
05-Sep-2012	DO	NULL	*********	NULL	*********	6.5	6.5	NULL	*********	NULL	*********
09-Oct-2012	DO	NULL	*********	NULL	*********	5.6	6.5	NULL	*********	NULL	*********
07-Nov-2012	DO	NULL	*********	NULL	*********	6.6	6.5	NULL	*********	NULL	*********
06-Dec-2012	DO	NULL	*********	NULL	*********	7	6.5	NULL	*********	NULL	*********
07-Jan-2013	DO	NULL	*********	NULL	*********	9.3	6.5	NULL	*********	NULL	*********
06-Feb-2013	DO	NULL	*********	NULL	*********	7.1	6.5	NULL	*********	NULL	*********
07-Mar-2013	DO	NULL	*********	NULL	*********	9.3	6.5	NULL	*********	NULL	*********
05-Apr-2013	DO	NULL	*********	NULL	*********	9.5	6.5	NULL	*********	NULL	*********
08-May-2013	DO	NULL	*********	NULL	*********	7.9	6.5	NULL	*********	NULL	*********
07-Jun-2013	DO	NULL	*********	NULL	*********	6.8	6.5	NULL	*********	NULL	*********
03-Jul-2013	DO	NULL	*********	NULL	*********	7	6.5	NULL	*********	NULL	*********
07-Aug-2013	DO	NULL	*********	NULL	*********	6.9	6.5	NULL	*********	NULL	*********
09-Sep-2013	DO	NULL	*********	NULL	*********	6.7	6.5	NULL	*********	NULL	*********
07-Oct-2013	DO	NULL	*********	NULL	*********	6.6	6.5	NULL	*********	NULL	*********
06-Dec-2013	DO	NULL	*********	NULL	*********	8.4	6.5	NULL	*********	NULL	*********
08-Jan-2014	DO	NULL	*********	NULL	*********	7.2	6.5	NULL	*********	NULL	*********
13-Jan-2014	DO	NULL	*********	NULL	*********	9.2	6.5	NULL	*********	NULL	*********
10-Feb-2014	DO	NULL	*********	NULL	*********	9.7	6.5	NULL	*********	NULL	*********
07-Mar-2014	DO	NULL	*********	NULL	*********	9.9	6.5	NULL	*********	NULL	*********
09-Apr-2014	DO	NULL	*********	NULL	*********	7.4	6.5	NULL	*********	NULL	*********
08-May-2014	DO	NULL	*********	NULL	*********	8.6	6.5	NULL	*********	NULL	*********
10-Jun-2014	DO	NULL	*********	NULL	*********	7.7	6.5	NULL	*********	NULL	*********
07-Jul-2014	DO	NULL	*********	NULL	*********	7	6.5	NULL	*********	NULL	*********
08-Aug-2014	DO	NULL	*********	NULL	*********	7	6.5	NULL	*********	NULL	*********
08-Sep-2014	DO	NULL	*********	NULL	*********	7	6.5	NULL	*********	NULL	*********
08-Oct-2014	DO	NULL	*********	NULL	*********	7	6.5	NULL	*********	NULL	*********
07-Nov-2014	DO	NULL	*********	NULL	*********	7.6	6.5	NULL	*********	NULL	*********
04-Dec-2014	DO	NULL	*********	NULL	*********	7.4	6.5	NULL	*********	NULL	*********
07-Jan-2015	DO	NULL	*********	NULL	*********	9	6.5	NULL	*********	NULL	*********
08-Oct-2010	E.COLI	NULL	*********	NULL	*********	NULL	*********	1.8	126	NULL	*********
05-Nov-2010	E.COLI	NULL	*********	NULL	*********	NULL	*********	1	126	NULL	*********
06-Dec-2010	E.COLI	NULL	*********	NULL	*********	NULL	*********	1	126	NULL	*********
06-Jan-2011	E.COLI	NULL	*********	NULL	*********	NULL	*********	1	126	NULL	*********
09-Feb-2011	E.COLI	NULL	*********	NULL	*********	NULL	*********	1	126	NULL	*********
03-Mar-2011	E.COLI	NULL	*********	NULL	*********	NULL	*********	1	126	NULL	*********
08-Apr-2011	E.COLI	NULL	*********	NULL	*********	NULL	*********	1	126	NULL	*********
06-May-2011	E.COLI	NULL	*********	NULL	*********	NULL	*********	1	126	NULL	*********
08-Jun-2011	E.COLI	NULL	*********	NULL	*********	NULL	*********	1	126	NULL	*********
07-Jul-2011	E.COLI	NULL	*********	NULL	*********	NULL	*********	1	126	NULL	*********

08-Aug-2011	E.COLI	NULL	*********	NULL	*********	NULL	*********	1	126	NULL	*********
08-Sep-2011	E.COLI	NULL	*********	NULL	*********	NULL	*********	1	126	NULL	*********
06-Oct-2011	E.COLI	NULL	*********	NULL	*********	NULL	*********	36	126	NULL	*********
07-Nov-2011	E.COLI	NULL	*********	NULL	*********	NULL	*********	1	126	NULL	*********
09-Dec-2011	E.COLI	NULL	*********	NULL	*********	NULL	*********	1	126	NULL	*********
09-Jan-2012	E.COLI	NULL	*********	NULL	*********	NULL	*********	1	126	NULL	*********
08-Feb-2012	E.COLI	NULL	*********	NULL	*********	NULL	*********	1	126	NULL	*********
08-Mar-2012	E.COLI	NULL	*********	NULL	*********	NULL	*********	1	126	NULL	*********
06-Apr-2012	E.COLI	NULL	*********	NULL	*********	NULL	*********	4	126	NULL	*********
08-May-2012	E.COLI	NULL	*********	NULL	*********	NULL	*********	40.5	126	NULL	*********
06-Jun-2012	E.COLI	NULL	*********	NULL	*********	NULL	*********	4.58	126	NULL	*********
09-Jul-2012	E.COLI	NULL	*********	NULL	*********	NULL	*********	2.4	126	NULL	*********
06-Aug-2012	E.COLI	NULL	*********	NULL	*********	NULL	*********	4.32	126	NULL	*********
05-Sep-2012	E.COLI	NULL	*********	NULL	*********	NULL	*********	1.26	126	NULL	*********
09-Oct-2012	E.COLI	NULL	*********	NULL	*********	NULL	*********	1	126	NULL	*********
07-Nov-2012	E.COLI	NULL	*********	NULL	*********	NULL	*********	1	126	NULL	*********
06-Dec-2012	E.COLI	NULL	*********	NULL	*********	NULL	*********	2.8	126	NULL	*********
07-Jan-2013	E.COLI	NULL	*********	NULL	*********	NULL	*********	1.65	126	NULL	*********
06-Feb-2013	E.COLI	NULL	*********	NULL	*********	NULL	*********	1.9	126	NULL	*********
07-Mar-2013	E.COLI	NULL	*********	NULL	*********	NULL	*********	1	126	NULL	*********
05-Apr-2013	E.COLI	NULL	*********	NULL	*********	NULL	*********	2.78	126	NULL	*********
08-May-2013	E.COLI	NULL	*********	NULL	*********	NULL	*********	2.3	126	NULL	*********
07-Jun-2013	E.COLI	NULL	*********	NULL	*********	NULL	*********	14.1	126	NULL	*********
03-Jul-2013	E.COLI	NULL	*********	NULL	*********	NULL	*********	1	126	NULL	*********
07-Aug-2013	E.COLI	NULL	*********	NULL	*********	NULL	*********	1	126	NULL	*********
09-Sep-2013	E.COLI	NULL	*********	NULL	*********	NULL	*********	1	126	NULL	*********
07-Oct-2013	E.COLI	NULL	*********	NULL	*********	NULL	*********	4.35	126	NULL	*********
06-Dec-2013	E.COLI	NULL	*********	NULL	*********	NULL	*********	1	126	NULL	*********
08-Jan-2014	E.COLI	NULL	*********	NULL	*********	NULL	*********	1.15	126	NULL	*********
13-Jan-2014	E.COLI	NULL	*********	NULL	*********	NULL	*********	1	126	NULL	*********
10-Feb-2014	E.COLI	NULL	*********	NULL	*********	NULL	*********	1	126	NULL	*********
07-Mar-2014	E.COLI	NULL	*********	NULL	*********	NULL	*********	0.89	126	NULL	*********
09-Apr-2014	E.COLI	NULL	*********	NULL	*********	NULL	*********	1	126	NULL	*********
08-May-2014	E.COLI	NULL	*********	NULL	*********	NULL	*********	3.5	126	NULL	*********
10-Jun-2014	E.COLI	NULL	*********	NULL	*********	NULL	*********	1	126	NULL	*********
07-Jul-2014	E.COLI	NULL	*********	NULL	*********	NULL	*********	7	126	NULL	*********
08-Aug-2014	E.COLI	NULL	*********	NULL	*********	NULL	*********	1	126	NULL	*********
08-Sep-2014	E.COLI	NULL	*********	NULL	*********	NULL	*********	1	126	NULL	*********
08-Oct-2014	E.COLI	NULL	*********	NULL	*********	NULL	*********	1	126	NULL	*********
07-Nov-2014	E.COLI	NULL	*********	NULL	*********	NULL	*********	1	126	NULL	*********
04-Dec-2014	E.COLI	NULL	*********	NULL	*********	NULL	*********	3.4	126	NULL	*********
07-Jan-2015	E.COLI	NULL	*********	NULL	*********	NULL	*********	1	126	NULL	*********
08-Oct-2010	FLOW	0.018	0.037	0.026	NL	NULL	*********	NULL	*********	NULL	*********

05-Nov-2010	FLOW	0.015	0.037	0.022	NL	NULL	**********	NULL	**********	NULL	**********
06-Dec-2010	FLOW	0.016	0.037	0.023	NL	NULL	**********	NULL	**********	NULL	**********
06-Jan-2011	FLOW	0.019	0.037	0.028	NL	NULL	**********	NULL	**********	NULL	**********
09-Feb-2011	FLOW	0.019	0.037	0.024	NL	NULL	**********	NULL	**********	NULL	**********
03-Mar-2011	FLOW	0.018	0.037	0.026	NL	NULL	**********	NULL	**********	NULL	**********
08-Apr-2011	FLOW	0.018	0.037	0.025	NL	NULL	**********	NULL	**********	NULL	**********
06-May-2011	FLOW	0.016	0.037	0.024	NL	NULL	**********	NULL	**********	NULL	**********
08-Jun-2011	FLOW	0.02	0.037	0.025	NL	NULL	**********	NULL	**********	NULL	**********
07-Jul-2011	FLOW	0.019	0.037	0.025	NL	NULL	**********	NULL	**********	NULL	**********
08-Aug-2011	FLOW	0.019	0.037	0.027	NL	NULL	**********	NULL	**********	NULL	**********
08-Sep-2011	FLOW	0.02	0.037	0.026	NL	NULL	**********	NULL	**********	NULL	**********
06-Oct-2011	FLOW	0.018	0.037	0.024	NL	NULL	**********	NULL	**********	NULL	**********
07-Nov-2011	FLOW	0.016	0.037	0.016	NL	NULL	**********	NULL	**********	NULL	**********
09-Dec-2011	FLOW	0.018	0.037	0.031	NL	NULL	**********	NULL	**********	NULL	**********
09-Jan-2012	FLOW	0.017	0.037	0.025	NL	NULL	**********	NULL	**********	NULL	**********
08-Feb-2012	FLOW	0.016	0.037	0.024	NL	NULL	**********	NULL	**********	NULL	**********
08-Mar-2012	FLOW	0.0155	0.037	0.022	NL	NULL	**********	NULL	**********	NULL	**********
06-Apr-2012	FLOW	0.0149	0.037	0.021	NL	NULL	**********	NULL	**********	NULL	**********
08-May-2012	FLOW	0.016	0.037	0.023	NL	NULL	**********	NULL	**********	NULL	**********
06-Jun-2012	FLOW	0.0165	0.037	0.022	NL	NULL	**********	NULL	**********	NULL	**********
09-Jul-2012	FLOW	0.0175	0.037	0.03	NL	NULL	**********	NULL	**********	NULL	**********
06-Aug-2012	FLOW	0.0169	0.037	0.025	NL	NULL	**********	NULL	**********	NULL	**********
05-Sep-2012	FLOW	0.0166	0.037	0.023	NL	NULL	**********	NULL	**********	NULL	**********
09-Oct-2012	FLOW	0.017	0.037	0.022	NL	NULL	**********	NULL	**********	NULL	**********
07-Nov-2012	FLOW	0.0161	0.037	0.028	NL	NULL	**********	NULL	**********	NULL	**********
06-Dec-2012	FLOW	0.0169	0.037	0.023	NL	NULL	**********	NULL	**********	NULL	**********
07-Jan-2013	FLOW	0.0168	0.037	0.021	NL	NULL	**********	NULL	**********	NULL	**********
06-Feb-2013	FLOW	0.01696	0.037	0.027	NL	NULL	**********	NULL	**********	NULL	**********
07-Mar-2013	FLOW	0.0161	0.037	0.019	NL	NULL	**********	NULL	**********	NULL	**********
05-Apr-2013	FLOW	0.016	0.037	0.02	NL	NULL	**********	NULL	**********	NULL	**********
08-May-2013	FLOW	0.0169	0.037	0.027	NL	NULL	**********	NULL	**********	NULL	**********
07-Jun-2013	FLOW	0.0161	0.037	0.022	NL	NULL	**********	NULL	**********	NULL	**********
03-Jul-2013	FLOW	0.0167	0.037	0.021	NL	NULL	**********	NULL	**********	NULL	**********
07-Aug-2013	FLOW	0.0161	0.037	0.022	NL	NULL	**********	NULL	**********	NULL	**********
09-Sep-2013	FLOW	0.0158	0.037	0.021	NL	NULL	**********	NULL	**********	NULL	**********
07-Oct-2013	FLOW	0.017	0.037	0.021	NL	NULL	**********	NULL	**********	NULL	**********
06-Dec-2013	FLOW	0.017	0.037	0.022	NL	NULL	**********	NULL	**********	NULL	**********
08-Jan-2014	FLOW	0.017	0.037	0.022	NL	NULL	**********	NULL	**********	NULL	**********
13-Jan-2014	FLOW	0.017	0.037	0.022	NL	NULL	**********	NULL	**********	NULL	**********
10-Feb-2014	FLOW	0.015	0.037	0.02	NL	NULL	**********	NULL	**********	NULL	**********
07-Mar-2014	FLOW	0.014	0.037	0.016	NL	NULL	**********	NULL	**********	NULL	**********
09-Apr-2014	FLOW	0.013	0.037	0.021	NL	NULL	**********	NULL	**********	NULL	**********
08-May-2014	FLOW	0.014	0.037	0.021	NL	NULL	**********	NULL	**********	NULL	**********

10-Jun-2014	FLOW	0.015	*0.037*	0.022	*NL*	NULL	*********	NULL	*********	NULL	*********
07-Jul-2014	FLOW	0.017	*0.037*	0.022	*NL*	NULL	*********	NULL	*********	NULL	*********
08-Aug-2014	FLOW	0.019	*0.037*	0.055	*NL*	NULL	*********	NULL	*********	NULL	*********
08-Sep-2014	FLOW	0.02	*0.037*	0.032	*NL*	NULL	*********	NULL	*********	NULL	*********
08-Oct-2014	FLOW	0.019	*0.037*	0.025	*NL*	NULL	*********	NULL	*********	NULL	*********
07-Nov-2014	FLOW	0.022	*0.037*	0.039	*NL*	NULL	*********	NULL	*********	NULL	*********
04-Dec-2014	FLOW	0.018	*0.037*	0.023	*NL*	NULL	*********	NULL	*********	NULL	*********
07-Jan-2015	FLOW	0.019	*0.037*	0.029	*NL*	NULL	*********	NULL	*********	NULL	*********
08-Oct-2010	pH	NULL	*********	NULL	*********	7.2	*6*	NULL	*********	8.2	*9*
05-Nov-2010	pH	NULL	*********	NULL	*********	7.2	*6*	NULL	*********	8	*9*
06-Dec-2010	pH	NULL	*********	NULL	*********	7.2	*6*	NULL	*********	8.2	*9*
06-Jan-2011	pH	NULL	*********	NULL	*********	7	*6*	NULL	*********	8	*9*
09-Feb-2011	pH	NULL	*********	NULL	*********	6.8	*6*	NULL	*********	8	*9*
03-Mar-2011	pH	NULL	*********	NULL	*********	6.9	*6*	NULL	*********	7.4	*9*
08-Apr-2011	pH	NULL	*********	NULL	*********	7	*6*	NULL	*********	7.9	*9*
06-May-2011	pH	NULL	*********	NULL	*********	7	*6*	NULL	*********	8	*9*
08-Jun-2011	pH	NULL	*********	NULL	*********	6.9	*6*	NULL	*********	7.9	*9*
07-Jul-2011	pH	NULL	*********	NULL	*********	7	*6*	NULL	*********	8.2	*9*
08-Aug-2011	pH	NULL	*********	NULL	*********	7.3	*6*	NULL	*********	8.1	*9*
08-Sep-2011	pH	NULL	*********	NULL	*********	7.3	*6*	NULL	*********	8.2	*9*
06-Oct-2011	pH	NULL	*********	NULL	*********	7.1	*6*	NULL	*********	8	*9*
07-Nov-2011	pH	NULL	*********	NULL	*********	7	*6*	NULL	*********	8	*9*
09-Dec-2011	pH	NULL	*********	NULL	*********	7	*6*	NULL	*********	8	*9*
09-Jan-2012	pH	NULL	*********	NULL	*********	6.8	*6*	NULL	*********	8.5	*9*
08-Feb-2012	pH	NULL	*********	NULL	*********	6.9	*6*	NULL	*********	8.8	*9*
08-Mar-2012	pH	NULL	*********	NULL	*********	7.6	*6*	NULL	*********	7.9	*9*
06-Apr-2012	pH	NULL	*********	NULL	*********	7.1	*6*	NULL	*********	7.8	*9*
08-May-2012	pH	NULL	*********	NULL	*********	7	*6*	NULL	*********	7.8	*9*
06-Jun-2012	pH	NULL	*********	NULL	*********	6.3	*6*	NULL	*********	7.8	*9*
09-Jul-2012	pH	NULL	*********	NULL	*********	7.2	*6*	NULL	*********	8	*9*
06-Aug-2012	pH	NULL	*********	NULL	*********	7.2	*6*	NULL	*********	8.3	*9*
05-Sep-2012	pH	NULL	*********	NULL	*********	7	*6*	NULL	*********	8.6	*9*
09-Oct-2012	pH	NULL	*********	NULL	*********	7	*6*	NULL	*********	7.9	*9*
07-Nov-2012	pH	NULL	*********	NULL	*********	6.7	*6*	NULL	*********	7.8	*9*
06-Dec-2012	pH	NULL	*********	NULL	*********	7.2	*6*	NULL	*********	7.8	*9*
07-Jan-2013	pH	NULL	*********	NULL	*********	7.3	*6*	NULL	*********	7.7	*9*
06-Feb-2013	pH	NULL	*********	NULL	*********	7	*6*	NULL	*********	7.6	*9*
07-Mar-2013	pH	NULL	*********	NULL	*********	7.2	*6*	NULL	*********	7.7	*9*
05-Apr-2013	pH	NULL	*********	NULL	*********	7	*6*	NULL	*********	7.9	*9*
08-May-2013	pH	NULL	*********	NULL	*********	7.2	*6*	NULL	*********	7.9	*9*
07-Jun-2013	pH	NULL	*********	NULL	*********	7.1	*6*	NULL	*********	8.3	*9*
03-Jul-2013	pH	NULL	*********	NULL	*********	7.1	*6*	NULL	*********	7.6	*9*
07-Aug-2013	pH	NULL	*********	NULL	*********	7	*6*	NULL	*********	8	*9*

09-Sep-2013	pH	NULL	*********	NULL	*********	7	6	NULL	*********	7.8	9
07-Oct-2013	pH	NULL	*********	NULL	*********	7.3	6	NULL	*********	8.1	9
06-Dec-2013	pH	NULL	*********	NULL	*********	7.2	6	NULL	*********	8.1	9
08-Jan-2014	pH	NULL	*********	NULL	*********	7.1	6	NULL	*********	8	9
13-Jan-2014	pH	NULL	*********	NULL	*********	7.1	6	NULL	*********	7.8	9
10-Feb-2014	pH	NULL	*********	NULL	*********	7.3	6	NULL	*********	7.9	9
07-Mar-2014	pH	NULL	*********	NULL	*********	7.2	6	NULL	*********	7.9	9
09-Apr-2014	pH	NULL	*********	NULL	*********	7.1	6	NULL	*********	7.7	9
08-May-2014	pH	NULL	*********	NULL	*********	7.1	6	NULL	*********	7.9	9
10-Jun-2014	pH	NULL	*********	NULL	*********	7.2	6	NULL	*********	7.9	9
07-Jul-2014	pH	NULL	*********	NULL	*********	7.3	6	NULL	*********	8.2	9
08-Aug-2014	pH	NULL	*********	NULL	*********	7.3	6	NULL	*********	7.8	9
08-Sep-2014	pH	NULL	*********	NULL	*********	7.4	6	NULL	*********	8.5	9
08-Oct-2014	pH	NULL	*********	NULL	*********	7	6	NULL	*********	7.8	9
07-Nov-2014	pH	NULL	*********	NULL	*********	7.3	6	NULL	*********	7.8	9
04-Dec-2014	pH	NULL	*********	NULL	*********	7.2	6	NULL	*********	8	9
07-Jan-2015	pH	NULL	*********	NULL	*********	7.2	6	NULL	*********	7.8	9
08-Oct-2010	TSS	0.23	2.8	0.23	4.2	NULL	*********	3.1	20	0.31	30
05-Nov-2010	TSS	0.3	2.8	0.3	4.2	NULL	*********	3.6	20	3.6	30
06-Dec-2010	TSS	0.39	2.8	0.39	4.2	NULL	*********	6.1	20	6.1	30
06-Jan-2011	TSS	0.27	2.8	0.27	4.2	NULL	*********	4.3	20	4.3	30
09-Feb-2011	TSS	0.48	2.8	0.48	4.2	NULL	*********	6.7	20	6.7	30
03-Mar-2011	TSS	0.58	2.8	0.58	4.2	NULL	*********	7.7	20	7.7	30
08-Apr-2011	TSS	0.94	2.8	0.94	4.2	NULL	*********	13.8	20	13.8	30
06-May-2011	TSS	0.42	2.8	0.42	4.2	NULL	*********	7	20	7	30
08-Jun-2011	TSS	0.77	2.8	0.77	4.2	NULL	*********	10.25	20	10.25	30
07-Jul-2011	TSS	0.81	2.8	0.81	4.2	NULL	*********	10.77	20	10.77	30
08-Aug-2011	TSS	0.59	2.8	0.59	4.2	NULL	*********	11.19	20	11.19	30
08-Sep-2011	TSS	1.2	2.8	1.2	4.2	NULL	*********	16.28	20	16.28	30
06-Oct-2011	TSS	1.2	2.8	1.2	4.2	NULL	*********	16.2	20	16.2	30
07-Nov-2011	TSS	0.34	2.8	0.34	4.2	NULL	*********	9.2	20	9.2	30
09-Dec-2011	TSS	1	2.8	1	4.2	NULL	*********	9.4	20	9.4	30
09-Jan-2012	TSS	0.8	2.8	0.8	4.2	NULL	*********	11.78	20	11.78	30
08-Feb-2012	TSS	0.25	2.8	0.25	4.2	NULL	*********	3.75	20	3.75	30
08-Mar-2012	TSS	0.27	2.8	0.27	4.2	NULL	*********	5.1	20	5.1	30
06-Apr-2012	TSS	0.55	2.8	0.55	4.2	NULL	*********	7.6	20	7.6	30
08-May-2012	TSS	0.42	2.8	0.42	4.2	NULL	*********	7	20	7	30
06-Jun-2012	TSS	0.89	2.8	0.89	4.2	NULL	*********	15.76	20	15.76	30
09-Jul-2012	TSS	0.54	2.8	0.54	4.2	NULL	*********	9.5	20	9.5	30
06-Aug-2012	TSS	0.74	2.8	0.74	4.2	NULL	*********	9.8	20	9.8	30
05-Sep-2012	TSS	0.44	2.8	0.44	4.2	NULL	*********	6.4	20	6.4	30
09-Oct-2012	TSS	0.37	2.8	0.37	4.2	NULL	*********	6.15	20	6.15	30
07-Nov-2012	TSS	0.62	2.8	0.62	4.2	NULL	*********	10.96	20	10.96	30

06-Dec-2012	TSS	0.3	2.8	0.3	4.2	NULL	**********	4.4	20	4.4	30
07-Jan-2013	TSS	0.57	2.8	0.57	4.2	NULL	**********	7.5	20	7.5	30
06-Feb-2013	TSS	0.27	2.8	0.27	4.2	NULL	**********	3.4	20	3.4	30
07-Mar-2013	TSS	0.23	2.8	0.23	4.2	NULL	**********	4.1	20	4.1	30
05-Apr-2013	TSS	0.96	2.8	0.96	4.2	NULL	**********	13.4	20	13.4	30
08-May-2013	TSS	2	2.8	3.6	4.2	NULL	**********	28.8	20	50	30
07-Jun-2013	TSS	0.88	2.8	1.55	4.2	NULL	**********	14	20	26	30
03-Jul-2013	TSS	0.117	2.8	0.117	4.2	NULL	**********	2.8	20	2.8	30
07-Aug-2013	TSS	0.397	2.8	0.397	4.2	NULL	**********	7.5	20	7.5	30
09-Sep-2013	TSS	0.3861	2.8	0.3861	4.2	NULL	**********	6.8	20	6.8	30
07-Oct-2013	TSS	0.6298	2.8	0.6298	4.2	NULL	**********	10.4	20	10.4	30
06-Dec-2013	TSS	0.5	2.8	0.5	4.2	NULL	**********	7	20	7	30
08-Jan-2014	TSS	0.3539	2.8	0.3539	4.2	NULL	**********	5.5	20	5.5	30
13-Jan-2014	TSS	1.3	2.8	1.3	4.2	NULL	**********	18.6	20	18.6	30
10-Feb-2014	TSS	0.159	2.8	0.159	4.2	NULL	**********	2.8	20	2.8	30
07-Mar-2014	TSS	0.18	2.8	0.18	4.2	NULL	**********	4	20	4	30
09-Apr-2014	TSS	0.28	2.8	0.28	4.2	NULL	**********	5.3	20	5.3	30
08-May-2014	TSS	0.17	2.8	0.17	4.2	NULL	**********	3.5	20	3.5	30
10-Jun-2014	TSS	0.2	2.8	0.2	4.2	NULL	**********	3	20	3	30
07-Jul-2014	TSS	0.44	2.8	0.44	4.2	NULL	**********	10.6	20	10.6	30
08-Aug-2014	TSS	0.27	2.8	0.27	4.2	NULL	**********	4.1	20	4.1	30
08-Sep-2014	TSS	0.4	2.8	0.4	4.2	NULL	**********	6	20	6	30
08-Oct-2014	TSS	0.93	2.8	0.93	4.2	NULL	**********	13	20	13	30
07-Nov-2014	TSS	0.34	2.8	0.34	4.2	NULL	**********	4.8	20	4.8	30
04-Dec-2014	TSS	1.03	2.8	1.03	4.2	NULL	**********	14.4	20	14.4	30
07-Jan-2015	TSS	0.65	2.8	0.65	4.2	NULL	**********	12.3	20	12.3	30

ATTACHMENT 9

Ammonia Limitation Derivations
2015 and 2010

4/29/2015 10:41:19 AM

Facility = DOC-Caroline Correctional Unit #2
Chemical = Ammonia
Chronic averaging period = 30
WLAa = 5.7
WLAc = 0.91
Q.L. = 0.20
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 9
Variance = 29.16
C.V. = 0.6
97th percentile daily values = 21.9007
97th percentile 4 day average = 14.9741
97th percentile 30 day average= 10.8544
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 1.83607978500884
Average Weekly limit = 1.83607978500884
Average Monthly Limit = 1.83607978500884

The data are:

9

[redacted]

Analysis of the Carolin[redacted]orrectional Unit 2 efflu[redacted]data for Ammonia

The statistics for Ammoni[redacted] are:

Number of values	=	1
Quantification level	=	.2
Number < quantification	=	0
Expected value	=	9
Variance	=	29.16001
C.V.	=	.6
97th percentile	=	21.90076
Statistics used	=	Reasonable potential assumptions - Type 2 data

The WLAs for Ammonia are:

Acute WLA	=	5.62
Chronic WLA	=	.91
Human Health WLA	=	----

The limits are based on chronic toxicity and 1 samples/month.

Maximum daily limit	=	1.330943
Average monthly limit	=	1.330943
Weekly average limit	=	1.330943

It is recommended that only the maximum daily limit be used.

DATA
9

ATTACHMENT 10

Total Residual Chlorine Limitation Derivation

4/29/2015 10:42:51 AM

Facility = DOC-Caroline Correctional Unit #2
Chemical = Chlorine
Chronic averaging period = 4
WLAa = 0.019
WLAc = 0.011
Q.L. = 0.10
# samples/mo. = 28
# samples/wk. = 7

Summary of Statistics:

observations = 1
Expected Value = .2
Variance = .0144
C.V. = 0.6
97th percentile daily values = .486683
97th percentile 4 day average = .332758
97th percentile 30 day average= .241210
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 1.60883226245855E-02
Average Weekly limit = 9.8252545713861E-03
Average Monthly LImit = 8.02152773888032E-03

The data are:

0.2

ATTACHMENT 11

March 1988 Stream Model

Attachment

MEMORANDUM

State Water Control Board

2111 North Hamilton Street | P. O. Box 11143 | Richmond, VA. 23230

SUBJECT: Stream Analysis for Field Unit #2 Discharge to Herring Creek

TO: Martin Ferguson, Jr., OWRM

FROM: Steve Crowther, NRO

DATE: March 16, 1988

RE: NPDES Permit #VA0023329

Please find attached a stream analysis for OWRM review and approval.

The State Department of Corrections has requested a permit modification to reflect a flow increase to 0.037 MGD. I have attached three model simulations and a copy of the previously approved April 17, 1980, model.

The first simulation is a rerun of the April 17, 1980, model. Similar results with acceptable variation were obtained on the current IBM-PC version of the model. The model had previously been run to maintain 5.0 mg/l D.O. in Herring Creek. The second simulation shows the effect of increasing the discharge flow to 0.037 MGD while holding all other conditions constant. The results of this flow increase were unacceptable. Therefore, the third simulation shows the effect of increasing the flow to 0.037 while decreasing the allowable cBODu from 32.5 mg/l to 26 mg/l. The results of the third simulation are acceptable.

The Field Unit #2 permit should be modified to include the following limitations:

Q = 0.037 MGD
BOD_5 = 20 mg/l
TSS = 20 mg/l
DO = 6.5 mg/l

SC/dg

hercrk

BACKGROUND CONDITIONS ARE:

Q= 0.1630 MGD D.O.= 5.068 MG/L CBODu= 3.00 MG/L NBODu= 0.00 MG/L

POT WILL BE GENERATED EVERY 0.20 MILE FROM THE BEGINNING OF A SEGMENT

VARIABLES FOR SECTION 1 ARE:

SEGMENT LENGTH = 2.10 MI VELOCITY = 3.273 MI/D
TEMP. = 30.0 °C ELEV = 150.00 FT SATURATION D.O. = 7.679 MG/L
Kd = 0.500 /DAY Kr = 0.190 /DAY Ka = 0.000 /DAY

K rates shown are at 20 degrees C. The model corrects them.

THE DISCHARGE AT THE BEGINNING OF THE SEGMENT:

Q= 0.0370 MGD D.O.= 6.50 MG/L CBODu= 26.00 MG/L NBODu= 0.00 MG/L

THE RESULTS FOR SECTION 1 ARE:

DISTANCE FROM END OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
.000	0.000	5.333	7.255	0.000
.200	0.200	5.293	7.123	0.000
.400	0.400	5.256	6.993	0.000
.600	0.600	5.223	6.866	0.000
.800	0.800	5.194	6.741	0.000
.000	1.000	5.168	6.619	0.000
.200	1.200	5.145	6.497	0.000
.400	1.400	5.126	6.379	0.000
.600	1.600	5.109	6.263	0.000
.800	1.800	5.094	6.149	0.000
.000	2.000	5.083	6.037	0.000
.100	2.100	5.078	5.982	0.000

VARIABLES FOR SECTION 2 ARE:

SEGMENT LENGTH = 2.90 MI VELOCITY = 3.273 MI/D
TEMP. = 30.0 °C ELEV = 130.00 FT SATURATION D.O. = 7.685 MG/L
Kd = 0.500 /DAY Kr = 0.203 /DAY Ka = 0.000 /DAY

K rates shown are at 20 degrees C. The model corrects them.

Run #2

Discharge flow has been increased from .028 to .037 MGD.

$CBOD_u$ has been reduced from 32.5 mg/l to 26 mg/l. The K_r rate has subsequently been changed from .203 to .190.

All other conditions have been held the same as the background model.

ATTACHMENT 12

Public Notice

Public Notice – Environmental Permit

PURPOSE OF NOTICE: To seek public comment on a draft permit from the Department of Environmental Quality that will allow the release of treated wastewater into a water body in Caroline County, Virginia.

PUBLIC COMMENT PERIOD: November 13, 2015 to December 14, 2015

PERMIT NAME: Virginia Pollutant Discharge Elimination System Permit – Wastewater issued by DEQ, under the authority of the State Water Control Board

APPLICANT NAME, ADDRESS AND PERMIT NUMBER: Virginia Department of Corrections
1001 Obici Industrial Blvd., Suite F, Suffolk, VA 23434
VA0023329

NAME AND ADDRESS OF FACILITY: Environmental Services Unit (ESU) / Caroline Correctional Unit #2
31285 Camp Road, Hanover, VA 23069

PROJECT DESCRIPTION: The Virginia Department of Corrections has applied for a reissuance of a permit for the public Environmental Services Unit (ESU) / Caroline Correctional Unit #2. The applicant proposes to release treated sewage wastewaters from housing units for incarcerated offenders at a rate of 0.037 million gallons per day into a water body. Sludge from the treatment process will be transported to the Powhatan Correctional Center (VA0020699) for further treatment prior to land application. The facility proposes to release the treated sewage in an unnamed tributary to Herring Creek in Caroline County in the York River watershed. A watershed is the land area drained by a river and its incoming streams. The permit will limit the following pollutants to amounts that protect water quality: pH, biochemical oxygen demand-5 day, total suspended solids, dissolved oxygen, ammonia as nitrogen, *E. coli*, and total residual chlorine. The permit will also require monitoring for total Kjeldahl nitrogen, nitrate+nitrite, total nitrogen and total phosphorus.

HOW TO COMMENT AND/OR REQUEST A PUBLIC HEARING: DEQ accepts comments and requests for public hearing by hand-delivery, email, fax or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. A public hearing may be held, including another comment period, if public response is significant, based on individual requests for a public hearing, and there are substantial, disputed issues relevant to the permit.

CONTACT FOR PUBLIC COMMENTS, DOCUMENT REQUESTS AND ADDITIONAL INFORMATION: The public may review the draft permit and application at the DEQ-Northern Regional Office by appointment or may request electronic copies of the draft permit and fact sheet.

Name: Douglas Frasier
Address: DEQ-Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193
Phone: (703) 583-3873 Email:Douglas.Frasier@deq.virginia.gov Fax: (703) 583-3821